Who Eats What, When, Where, and Why?

Microeconomics is all about choices: It's the study of why individuals choose to buy goods and services, and how these choices are revealed through the workings of the market. The study of food choices is challenging for economists because these choices are so personal to consumers. Food choices depend not just on prices and income, but also on such individualized factors as taste, family structure and traditions, age, health, and lifestyle. When we economists are asked how much information we need to research how food choices respond to changes in socioeconomic conditions, we're like Oliver Twist at mealtime: "Please sir, I want some more!"

A case in point: New *Dietary Guidelines for Americans* have just been released, providing authoritative advice on good dietary habits that can promote health and reduce risk for major chronic diseases. Will Americans follow the recommendations and make healthier food and lifestyle choices? And if they do, how will these food choices be reflected in the marketplace? What will changing food choices mean for American agriculture? Economic research can help answer these questions.

ERS is meeting this challenge with a new data-collection initiative. In fiscal year 2005, ERS received funding to develop an integrated, comprehensive data and analysis framework of the post-farm food system. The framework will identify and track changes in food supply and consumption patterns and help us to understand those changes. It will also help us explore the relationship between consumers' knowledge and attitudes and their eating patterns. We are also developing the Flexible Consumer Behavior Survey (FCBS) that will complement the Department of Health and Human Services' National Health and Nutrition Examination Survey (NHANES), which provides information on food and nutrient intake and health status. The FCBS will provide information needed to assess linkages among individuals' knowledge and attitudes about dietary guidance and food safety and their economic circumstances, food choices, and nutrient intakes. Combining the NHANES with this new survey will allow us to analyze how individual behavior, information, and economic factors affect food choices, dietary status, and health outcomes.

The *Guidelines* tell what our food choices need to be, but we still need to figure out how to get there, how long it will take, and what changes are at stake for American agriculture. Understanding eating behavior is key to developing a solution to our Nation's obesity problem. Our investment in people, tools, and information will help us find the right mix of policies to move us toward meeting the *Guidelines.* Future issues of *Amber Waves* will report new findings from our food consumption research, so stay tuned.

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Deputy Director for Staff Analysis and Communications
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Cover photo: Detail from facade of Mellon Building complex in Washington, DC, headquarters for the EPA. The 1.25-million-square-foot building was intended to remedy the Federal Government's lack of assembly space for large gatherings and ceremonies which existed prior to 1935. It's best known as the site where the North Atlantic Treaty was signed in 1949. The Mellon Auditorium stands, without question, among the very finest classical buildings in America. Photo by Stephen Peterson.

Amber Waves

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Economic Research Service/USDA

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FEATURES

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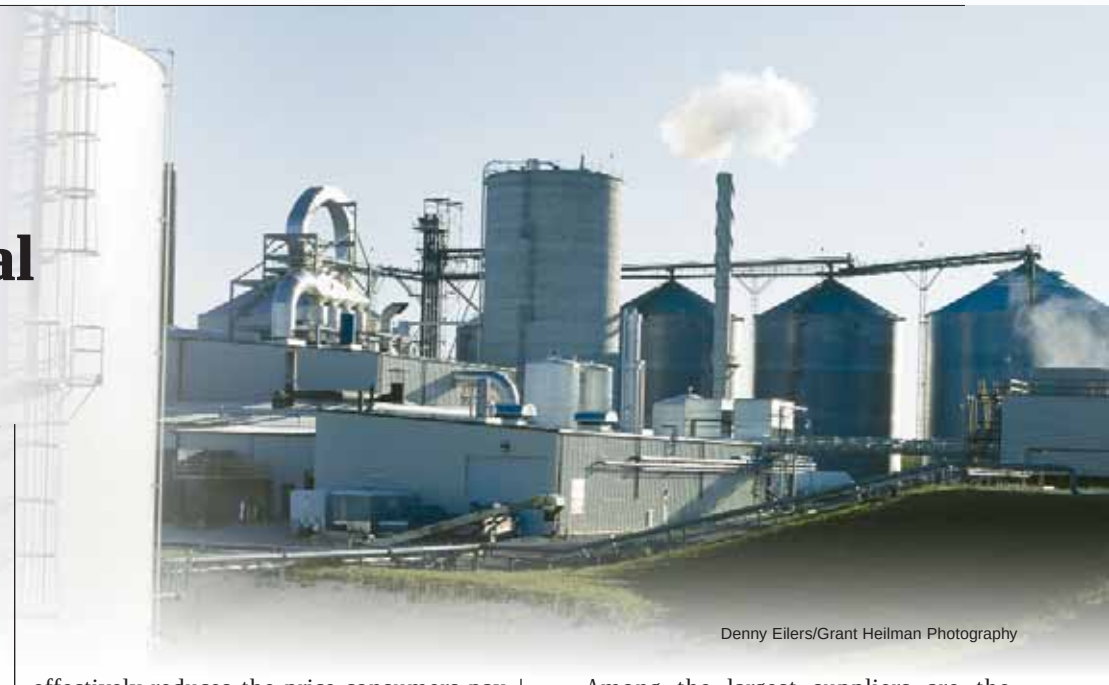
F I N D I N G S

Ethyl Alcohol Becomes a Global Commodity



Denny Eilers/Grant Heilman Photography

Ethyl alcohol can be made from any commodity containing starch or sugar, including sorghum, barley, grasses, and even paper: The U.S. Postal Service has investigated converting undeliverable mail to ethyl alcohol. Corn is the primary commodity used in the U.S, however, because, in this country, it is the least costly way to generate starch. In 2003/04, 1.2 billion bushels of the 10.1-billion-bushel corn crop was used to produce ethyl alcohol, up 23 percent from 2002/03, which itself was a 36-percent rise from 2001/02.

Why the increase in ethyl alcohol production? Ethyl alcohol has a number of industrial uses, including use as a drying agent in perfumes and aftershave lotions. Accounting for most of the growth in use, however, is the production of ethanol—a blend of ethyl alcohol and gasoline. Motor vehicles using gasoline containing ethanol can reduce carbon monoxide emissions. In 1978, to encourage greater production and use of ethanol, policymakers passed legislation creating a "blender tax credit," which effectively reduces the price consumers pay for ethanol. In addition, the requirements of the Clean Air Act amendments have prompted some States, including California, Connecticut, and New York, to switch to using ethanol as an oxygenate in gasoline, because it is less damaging to the environment than other oxygenates.

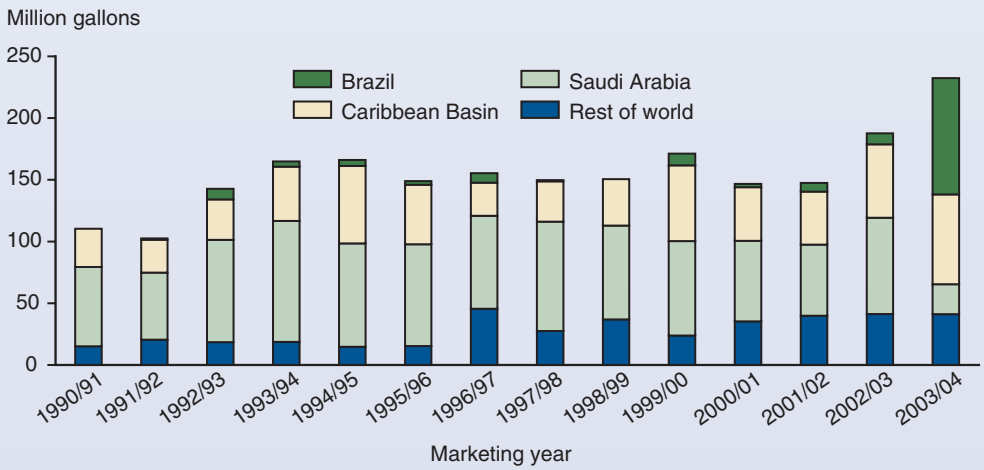
Most ethyl alcohol used in the U.S. is produced domestically: U.S. capacity is currently estimated at 3.6 billion gallons per year. However, sharp increases in U.S. ethanol use this past year pushed prices high enough to stimulate imports, despite duties matching the blender tax received by U.S. producers of alcohol used for fuel.

Among the largest suppliers are the countries of the Caribbean Basin Initiative, which are exempted from duties on any ethanol produced from regional feed stocks to stimulate economic growth in this region. Another large supplier is Saudi Arabia, which produces alcohol from ethylene gas, a byproduct of petroleum refining.

But the largest supplier in 2003/04 was Brazil, which began producing ethyl alcohol from sugar to cut petroleum imports after petroleum prices rose in 1973. The Brazilian Government specifies the percentage of alcohol to be included in gasoline, depending on sugar prices, and encourages the production of automobiles that run on alcohol.

Brazil's future in the U.S. ethanol market will depend on infrastructure developments, petroleum prices, and the price of sugar versus corn. Brazil recently announced plans to improve infrastructure to facilitate export loading and to cut time and costs in ship loading. But petroleum prices near $50 per barrel have boosted Brazilian demand for ethyl alcohol, basically eliminating exports to the U.S.

In 2003/04, Brazil was the leading source for U.S. ethyl alcohol imports



Source: Bureau of the Census.

Allen Baker, albaker@ers.usda.gov

This finding is drawn from . . .

Feed Outlook Reports, available at: http://usda.mannlib.cornell.edu/reports/erssor/field/fds-bb/

See also the ERS Feedgrains Data Delivery system, available at: www.ers.usda.gov/db/feedgrains/

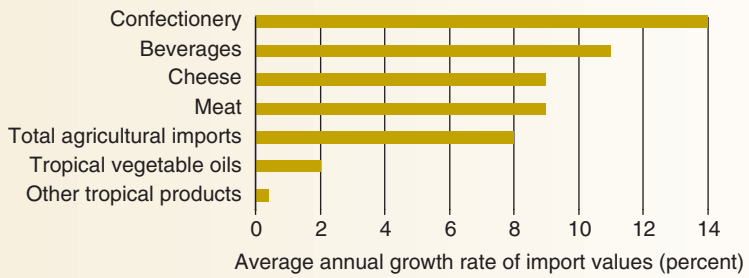
Americans Have Growing Appetite for Imported Foods

In fiscal year 2005, the U.S. trade surplus in agriculture is expected to significantly decrease, or even disappear for the first time since 1958. The reason is not so much declining exports as a surge in the value of agricultural imports, which are expected to reach $58 billion this year, up from $41 billion in 2002. Recent depreciation of the dollar played a role in this surge, contributing to a 12-percent rise in average import prices since 2001. The increase in the value of imports has been strongest in products coming from the European Union and Canada, where the U.S. dollar has weakened. U.S. demand for agricultural imports has proven to be relatively inelastic in volume (that is, rising import prices have not led to much decline in quantity consumed). Thus, a large part of the growth in the value of U.S. agricultural imports since 2001 can be attributed to higher import prices resulting from the lower exchange rate of the dollar.

Another driver of growth in U.S. agricultural imports has been a dramatic rise in consumer demand for prepared and processed foods, which, in turn, is driven by population growth, increasing ethnic diversity, and rising incomes. These preferences are seen in higher domestic sales by food manufacturers as well as a growing share in U.S. agricultural imports. The share of processed food in U.S. agricultural imports is now close to 63 percent.

Within the processed food category, the value of imports of confectionery; beer and wine; dairy products, such as cheese; and meat have grown the fastest over the last 5 years. Other fast-growing processed foods include nuts and seeds; grain products, such as flour and pasta; soft drinks; and prepared foods, such as snacks. Another major contributor to import growth is the supply of fresh fruits and vegetables during months when domestic production is seasonally low.

In 2000-04, U.S. agricultural import growth was greatest in nontropical processed food products



Source: Bureau of the Census.

The volume of agricultural imports has increased roughly in line with the U.S. population, which is about 1 percent per year. The variety of imported foods, including tropical products, has increased along with the ethnic diversity of the population and consumers' greater exposure to ethnic foods. Rising disposable incomes have made purchases of expensive foreign foods, such as wine, beer, cheese, meats, chocolate, and premium coffee, more affordable.

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This finding is drawn from . . .

The ERS Briefing Room on U.S. Agricultural Trade, at: www.ers.usda.gov/briefing/agtrade/

U.S. Agricultural Trade Update, available at: www.ers.usda.gov/publications/so/view.asp?f=trade/fau-bb/

USDA

Will Hard White Wheat Become a Sustainable Wheat Class?

Hard white wheat (HWW) has gained popularity in the domestic market and overseas, particularly in Asia. HWW has the potential for yielding 1-3 percent more flour than other wheats. Its end-use characteristics—such as lighter color in bread made from HWW flour and good color stability and noodle texture—are particularly well-suited for whole-wheat products, pan breads, tortillas, and certain kinds of oriental noodles.

Though U.S. wheat farmers have grown mostly hard red winter and hard red spring wheats, many State breeding programs began refocusing their wheat breeding toward HWW in the mid-1990s anticipating rising demand for its end-use characteristics. By the late 1990s, Kansas State University was devoting three-quarters of its program to HWW. Other States soon followed suit.

HWW plantings spiked in 2003. A major factor contributing to this was a $20 million government incentive program created by Congress for 2003-05. Farmers receive $0.20 per bushel for high-quality HWW (denoted as U.S. grade No. 1 or No. 2), which, in 2003, together with other potential government payments, amounted to about 10 percent of the expected farm price. These incentive payments, combined with newly released, higher yielding varieties and above-average quality attributes, caused HWW plantings to nearly triple in 2003 to 900,000 acres, up from 310,000 in 2002. Still, HWW production accounts for barely over 2 percent of all wheat acreage in major HWW-producing States, and sales are mostly limited to domestic milling.

The expansion of HWW acreage is limited by concerns over the risk of sprout damage, caused by excessive precipitation after the crop has matured. The 2004 HWW crop suffered widespread sprouting, particularly in Kansas, where sprouting affected 40-50 percent of the crop. Affected producers lost their incentive payment when their wheat graded worse than No. 2. However, they were not entitled to crop insurance indemnity payments for quality loss unless their wheat graded No. 5 or worse. Thus, producers with wheat graded No. 3 or 4 received neither payment.

The discontinuation of the incentive program beyond the 2005 crop and concerns that sprout damage could recur will likely slow the expansion of HWW production. In addition, strong competition from Australia and Canada in the Asian noodle markets makes it unlikely that the marketplace will generate strong price premiums for HWW. Continuing expansion of HWW production thus depends on the development of new, higher yielding varieties that are more tolerant to sprout damage.

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This finding is drawn from . . .

Hard White Wheat At A Crossroads, by William Lin and Gary Vocke, WHS-04K-01, USDA/ERS, December 2004, available at: www.ers.usda.gov/publications/whs/dec04/whs04k01/

New Approaches Boost Food Stamp Participation by Elderly People


Creatas

USDA's Food Stamp Program (FSP) is designed to enable low-income Americans to buy nutritious foods. However, not all who are eligible to participate do so. Just over half (54 percent) of all eligible people participated in fiscal year 2002, and only about one in four eligible elderly people participate. These low participation rates might signal that barriers exist for elderly people in accessing the FSP. In 2002, USDA and six States tested approaches to increasing participation by low-income elderly through three demonstration projects. Simplifying the application process, helping the elderly complete the process, and substituting food packages for food stamps boosted participation.

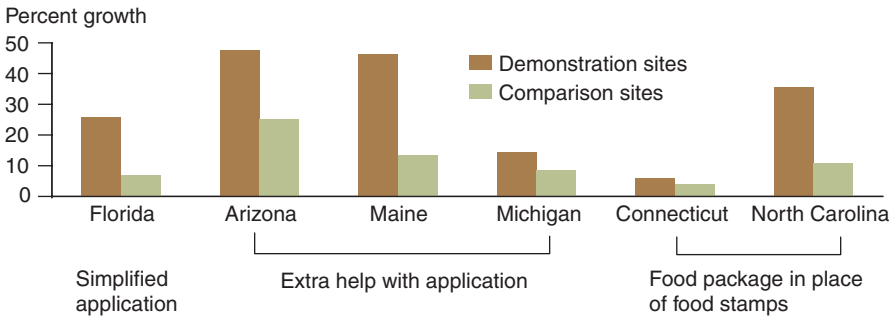
In the first demonstration project, two counties in Florida simplified the application process by using a one-page, large-print application form. Applicants were required to prove their citizenship, but many other FSP documentation requirements were eliminated. Face-to-face interviews were waived, and social security income was verified electronically using existing databases.

In the second project, special application assistants in four counties in Arizona, Maine, and Michigan worked one-on-one with elderly applicants to help them understand program requirements, assemble required documents, and complete the application.

The final demonstration project offered elderly households without nonelderly members the choice of receiving packages of USDA-supplied foods in place of food stamps. Local nonprofit organizations in the Hartford, CT, area and Alamance County, NC, assembled the packages and delivered them to demonstration project participants at congregate meal sites, food banks, and other places where low-income elderly are likely to gather. Participants with disabilities or transportation difficulties could have their packages delivered to their homes.

To estimate the impact of the demonstration projects, growth in participation at the demonstration sites was compared with participation growth at demographically similar comparison sites and the difference was attributed entirely to the demonstration projects. Preliminary findings show that growth in FSP participation by eligible elderly at the demonstration sites outpaced participation growth at the comparison sites, although differences varied by project and by State. For example, providing one-on-one assistance to elderly applicants boosted participation 33 percentage points more at the demonstration site than at the comparison sites in Maine, 22 points more in Arizona, and 6 points more in Michigan**.** Future analyses will refine and test the validity of these preliminary estimates.

Growth in elderly FSP participation was higher in demonstration sites



Elizabeth Dagata, edagata@ers.usda.gov

This finding is drawn from . . .

Food Stamp Program—Elderly Nutrition Demonstrations: Interim Report on Elderly Participation Patterns, by Scott Cody, Mathematica Policy Research, Inc.**,** ERS project representative: Elizabeth Dagata, E-FAN-04-009, USDA/ERS, June 2004, available at: www.ers.usda.gov/publications/efan04009/


Barry Runk/Grant Heilman Photography

Hog Contracts Signal Producers To Improve Quality

Nearly 70 percent of hogs in the U.S. are sold to pork slaughter companies (packers) under pre-arranged marketing contracts, up from 11 percent in 1993. Marketing contracts between packers and hog producers typically specify the quantity of hogs to be purchased on specified dates and places, and provide hog producers a secure outlet and specific pricing terms. Many of these contracts awarded price premiums for carcass leanness and weight, providing strong incentives for producers to raise lean hogs needed for the lower fat meats demanded by consumers. From 1992 to 2002, the percentage of lean muscle of a typical pork carcass rose from 49.5 to 55.5 percent.

But this leanness came at a cost. The genetic lines that produced leaner hogs were often carriers of the "stress" gene, which was linked to a condition referred to as "pale, soft, and exudative" (PSE). PSE pork—which is disliked by packers, retailers, and consumers—has a very light color, soft texture, and is subject to fluid loss. Controlling the PSE condition proved to be difficult because packers must be able to measure and reward producers for reducing PSE-related attributes. However, indicators of the PSE condition could not be readily measured at high-speed processing lines that slaughter 1,000 hogs per hour. In addition, by the time PSE problems become apparent (20-24 hours postmortem), the identity of the producer may have been lost.

Americans' Whole-Grain Consumption Below Guidelines

Evidence indicates that eating whole grains can reduce the risk of heart disease and some cancers. The newly revised *Dietary Guidelines for Americans*, released in January 2005, recommend that half of all daily grain servings be whole grains. For an individual who consumes 2,200 calories a day, this would mean eating 3½ ounces of whole grains a day, equal to 1½ cups of cooked brown rice or 3½ slices of whole-wheat bread.

Food availability and food intake data tell us that most Americans are not meeting these guidelines. Historically, Americans have consumed ever-increasing amounts of refined-grain products and fewer servings of whole grains. ERS researchers annually calculate the amount of food available for human consumption in the United States. The food availability data measure the flow of raw and semi-processed food commodities through the U.S. marketing system. Between 1972 and 2003, per capita annual availability of all grain products increased 46 percent, from 133 pounds per person to 194 pounds per person.

After adjusting the availability data for waste and losses, Americans were eating, on average, 10 servings of grains a day in 2003—three servings more than recommended by the new dietary guidelines for someone who consumes 2,200 calories per day. Of those 10 servings, whole grains accounted for just over 1 serving. In food intake surveys from 1999-2000, nearly 40 percent of Americans did not report eating any whole grains in an entire day.

In the past, dietary changes have developed slowly over time. Food manufacturers can serve as catalysts to change by quickly responding to or even anticipating dietary trends. ERS researchers found that for those consumers who said they ate whole-grain foods, the bulk of those foods consisted of whole-grain crackers, salty snacks, and ready-to-eat cereals. Responding to greater emphasis on the health benefits of whole grains, General Mills announced that it would reformulate all of its breakfast cereals to qualify them as either a good or excellent source of whole grains. As other major food manufacturers change product formulations and introduce new whole-grain products, consumers may find whole-grain products more plentiful.

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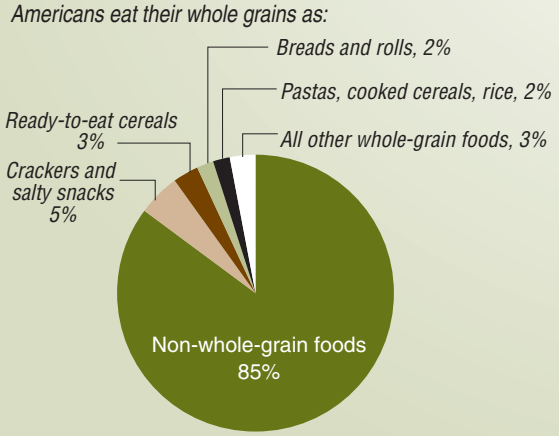
Jean Buzby, jbuzby@ers.usda.gov

How Americans consume their grains



Source: ERS analysis of 1999-2000 National Health and Nutrition Examination Survey (NHANES) data.

USDA

ERS annually calculates the amount of grains and several hundred other foods available for consumption in the U.S. This series provides data back to 1909 for many commodities and is the only continuous source of data on food and nutrient availability in the U.S. For more information, visit www.ers.usda.gov/data/foodconsumption.

Packers turned to marketing contracts to maintain incentives for producing leaner hogs and, at the same time, control PSE-related attributes. These marketing contracts strove to limit PSE problems by specifying and monitoring input requirements—most importantly genetic lines. How hogs are handled also influences PSE. For example, minimal force while moving hogs, nonslip loading ramps, and less crowding of hogs while on the way to the packing plant all make for less stressed hogs.

While considerable progress has been made in breeding out the stress gene, two pork quality audits revealed that the PSE condition actually worsened—rising from 10.2 percent of slaughter hogs in 1992 to 15.5 percent in 2002. This suggests hog-handling problems may have become an important contributor to PSE-related problems. Some large pork companies stipulate in their marketing contracts that producers raise hogs in a humane manner or in a way that optimizes pork quality.

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This finding is drawn from . . .

Pork Quality and the Role of Market Organization, by Steve W. Martinez and Kelly Zering, AER-835, USDA/ERS, October 2004, available at: www.ers.usda.gov/publications/aer835/

FINDINGS

Small Farms Can Grow Into Large Enterprises

PhotoDisc

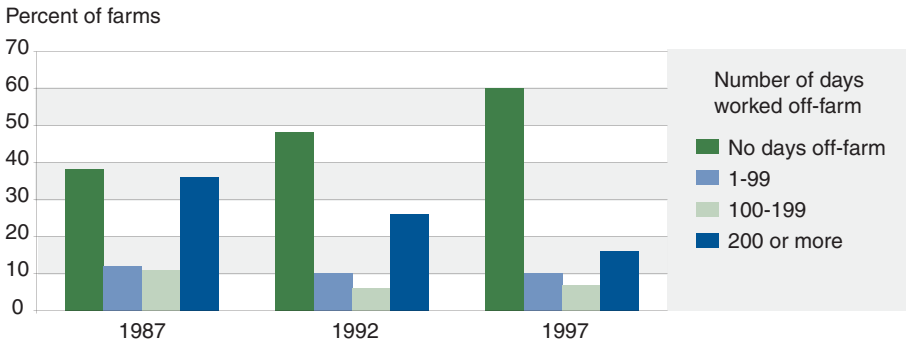
Today's farmers know first-hand that farming is not what it used to be. Farmers are responding to challenges—competition with global markets, the need for new alternative markets where traditional markets have declined, and consumer demands for fresher, safer products—in order to expand their operations. Smaller farms, in particular, may have more difficulty in adapting to the changing marketplace because of, among other things, lack of capital and other resources. Yet, as a recent ERS analysis shows, some smaller farms manage to grow into large commercial operations.

Using agricultural census data spanning 1982-97, ERS researchers identified over 5,000 small part-time farm enterprises with limited sales and tracked them over time. In 1982, these farms had less than $10,000 in annual sales but produced relatively high-value products, generating at least $500 of sales per acre in 1997. Some operators of such farms may not wish to expand into larger enterprises because of other interests. But by 1997, 644 of these farms had grown into commercial operations with annual sales of $100,000 or more, and 97 of them had over $500,000 in sales. Total 1997 sales among these 644 *emergent adaptive farms* (EAFs) came to $224.9 million, compared with less than $5 million in total group sales for 1982. The analysis revealed several characteristics of EAFs:

- The majority (61 percent) of EAF operators in 1982 were young to middle-aged (under age 44) farmers/ranchers. Among all farmers, only 36 percent fall into this age group.
- Most EAFs were organized as sole proprietorships, and, over time, about one-fifth moved to partnerships or incorporated.
- Three commodity groups—grape vineyards, nursery and tree products, and vegetable and melon farming—accounted for 41 percent ($93 million) of sales in 1997, while floriculture, other noncitrus fruit, and tree nut farming accounted for another 23 percent ($54 million).
- Off-farm work offered vital financial support during the early years of the typical EAF. As their businesses expanded, however, EAF operators spent more time on their farming enterprises. Thirty-five percent of EAF operators worked at least 200 days off the farm in 1987, but that share declined to 16 percent by 1997 as farm operations expanded.

Most EAFs were in major fruit- and vegetable-producing States, often in or near metropolitan areas. Metro proximity proved critically important to their success: It provided both off-farm employment options to help finance tiny startups and close-by marketing opportunities to support their growth.

Operators of emergent adaptive farms worked fewer days off-farm over time



Source: U.S. Census of Agriculture Longitudinal Data, 1997.

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This finding is drawn from . . .

The ERS Briefing Room on Farm Structure, at: www.ers.usda.gov/briefing/farmstructure/

New Tax Laws *Benefit Farmers*

The American Jobs Creation Act of 2004 represents a major overhaul of U.S. Federal income tax laws applicable to farmers and other business taxpayers. The primary focus of the Act was the replacement of a tax benefit that allowed U.S. exporters to exclude a portion of their net foreign sales from their gross income, thus reducing their tax burden. The World Trade Organization (WTO) declared this exclusion a prohibited export subsidy, which prompted the European Union to impose sanctions on a variety of U.S. farm products, including some livestock and livestock products, oil seeds, cereals, vegetables, fruits, nuts, and cotton. Passage of the 2004 legislation has already resulted in these retaliatory tariffs being lifted.

The Act replaces the exclusion with a new tax deduction for income from domestic production activities for U.S. manufacturers, including farmers. The new deduction goes well beyond the exclusion and applies to all qualifying manufacturers, regardless of whether they export, making it less likely to trigger WTO sanctions. Thus, while few farmers directly benefited from the exclusion, a majority of commercial farms will pay lower Federal income taxes as a result of this new deduction. The new deduction is not limited to farm corporations but is available to farm sole proprietors, partnerships, S corporations and estates, and trusts. Farmer cooperatives and agribusinesses involved in the production or processing of agricultural products are also considered manufacturers. The deduction, however, is limited to no more than 50 percent of wages paid to hired labor. This limitation will reduce tax savings for farmers who would otherwise qualify, but who use little or no hired farm labor in their farming operation.

The Act contains other tax provisions of significance to farmers, including a 2-year extension of the $100,000 small-business expensing provision that allows most farmers to write off their entire investment in farm machinery and equipment in the current year. Other changes include an extension of the replacement period from 2 years to 4 years or more for livestock sold on account of weather-related conditions and a provision that will allow farmers to use income averaging without triggering the alternative minimum tax.

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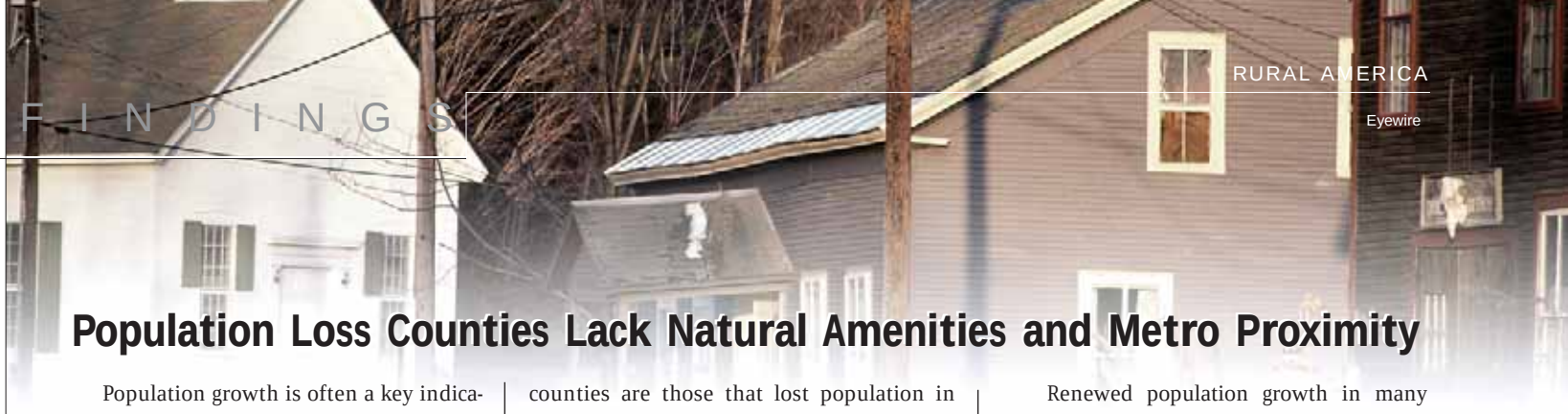
For more information, see . . .

The ERS Federal Taxes Briefing Room, at www.ers.usda.gov/briefing/federaltaxes/

Significant provisions of the American Jobs Creation Act of 2004 include:

- Repealing the foreign sales corporation/extraterritorial income provisions that were declared an illegal trade subsidy by the World Trade Organization.
- Enacting a new deduction for U.S. manufacturers, including farmers.
- Extending the $100,000 small-business capital expensing provision.
- Extending the replacement period for livestock sold due to weather conditions.
- Allowing farmers to use income averaging without triggering the alternative minimum tax.
- Increasing tax incentives for the production of ethanol and biodiesel.
- Eliminating the tobacco marketing and price support programs and approving a buyout of quota owners and tobacco growers.


Eyewire

Population Loss Counties Lack Natural Amenities and Metro Proximity

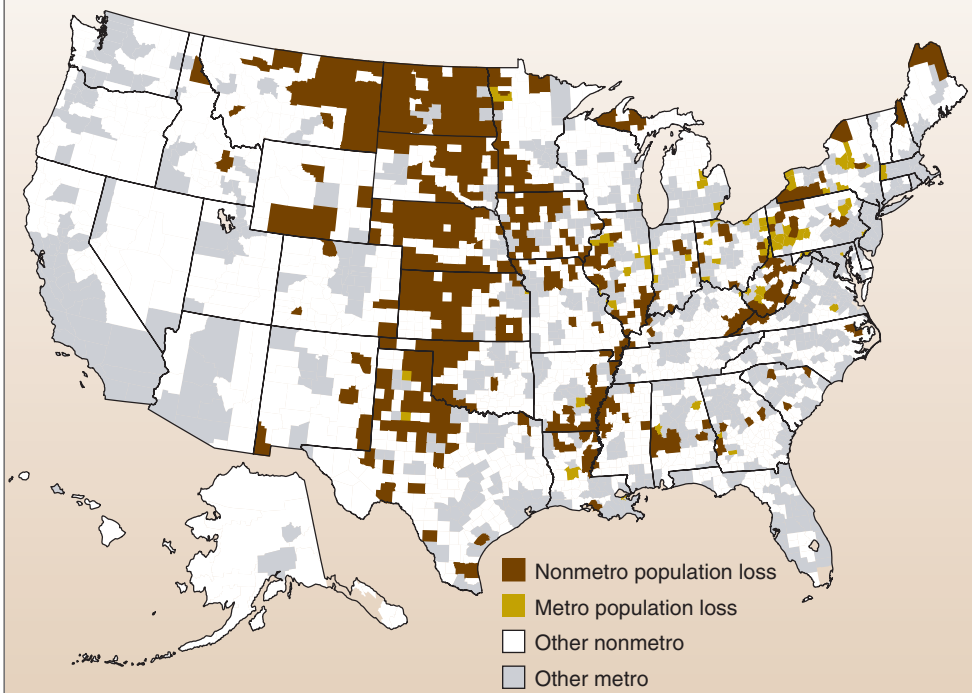
Population growth is often a key indicator of economic and social well-being. Population loss, on the other hand, often signals weak economic conditions in the community. Hundreds of towns throughout a wide swath of America's Heartland face an entrenched form of population loss, often covering several decades. The root cause of this pattern is technological change, which has led to increased agricultural production with less labor. Such changes have resulted in long-term declines in farming-related jobs and increases in off-farm jobs. As rural businesses, schools, and hospitals have closed in response to waves of outmigration, compounded by rising costs for providing critical services, rural communities face cycles of outmigration that are difficult to break. To highlight the fiscal and policy choices stemming from such conditions, ERS added *Population Loss Counties* to its recently updated county typology. Population loss counties are those that lost population in both the 1980s and 1990s.

Of the 2,052 nonmetro counties in the U.S., more than 25 percent are classified as population loss counties, with an average population size half that of other nonmetro counties. In 2003, only 15 percent of nonmetro residents (7.6 million of 49.8 million people) lived in these counties. They are most heavily concentrated in the Great Plains and extend eastward into the Corn Belt. North Dakota experienced the most widespread pattern of outmigration of any State, with declines in all but three of its nonmetro counties. Other clusters of population loss counties are found in the lower Mississippi Valley and central Appalachia. Only 6 percent of metro counties lost population in both of these decades. (Western Pennsylvania includes the only significant cluster of metro counties losing population.)

Renewed population growth in many rural and small town settings is thwarted by remoteness from urban centers and lack of natural amenities, such as temperate climates and landscapes with open vistas. Population loss counties are far more likely than other nonmetro counties to be classified as farming dependent and are far less likely to have developed an alternative economic base. The same geographic characteristics that are ideal for agriculture—relatively flat topography, long, hot summers, and isolation from urban encroachment—are not conducive to economic development from recreation, tourism, or retirement. Less than 4 percent of nonmetro population loss counties are also classified as recreation counties in ERS's typology (compared with about 18 percent of all other nonmetro counties), and less than 1 percent are typed as retirement destinations. In addition, population loss counties are half as likely to be adjacent to metro counties than other nonmetro counties.

Lack of natural amenities, rather than the presence of agriculture per se, creates barriers to renewed population growth in many rural and small town settings. Indeed, population loss is noticeably absent in the intermountain West and coastal settings, where recreation and retirement economies prevail. Solutions to stem population loss are varied and yield mixed results in areas with few employment prospects. For example, one strategy—to locate less desirable facilities, such as prisons and waste disposal plants, in such areas—has had some success. Another approach to attract residents to rural areas is to use tax breaks and credit incentives (as in the proposed New Homestead Act) in counties experiencing long-term outmigration.

Population loss counties are clustered in the Great Plains, Corn Belt, and Appalachia



Population loss counties—number of residents declined both between 1980 and 1990 and between 1990 and 2000.
Prepared by ERS using U.S. Census Bureau data.

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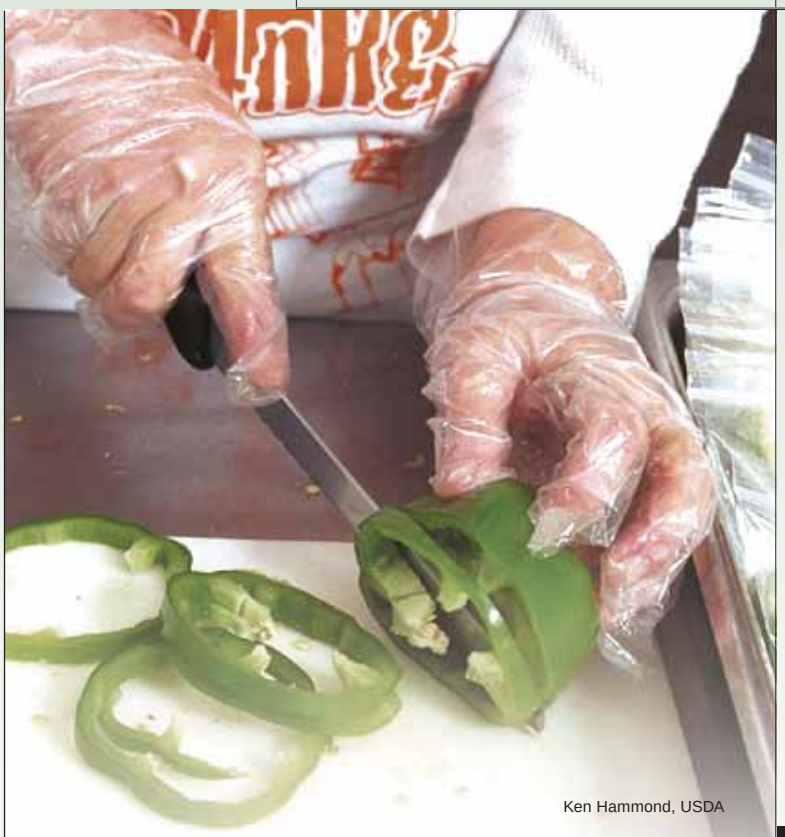
This finding is drawn from . . .

The County Typology page of the ERS Briefing Room on Measuring Rurality:
www.ers.usda.gov/briefing/rurality/typology/

Former Welfare Recipients Affect Economic Growth and Wages

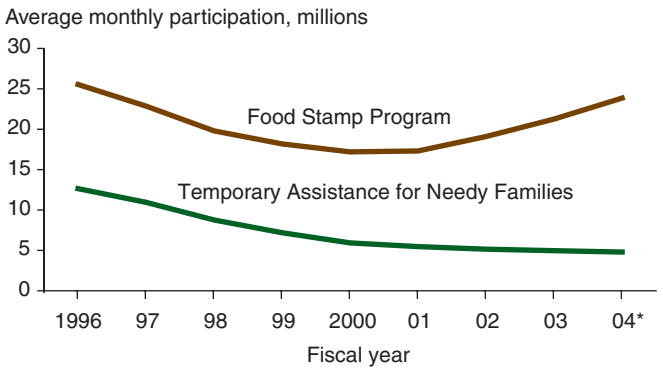
As Congress considers reauthorization of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, a primary focus remains on moving public assistance recipients who are not working into jobs. During 1996-2000, a period of strong economic growth, an estimated 2.4 million new workers moved from public assistance to primarily low-skill jobs, representing 18 percent of employment growth during that time. Temporary Assistance for Needy Families (TANF) caseloads fell by 50 percent, from 12.6 million recipients to 5.9 million. Food stamp caseloads fell by 30 percent from 25.5 million recipients to 17.2 million. Since the recession in 2001, hiring has been slow to recover, with substantial job growth starting in 2004. Food stamp caseloads began increasing in 2001 and have continued to increase through 2004 in response to economic conditions and expanded efforts to enroll eligible nonparticipants into the program. However, TANF caseloads have continued to fall, although at a slower rate in 2003 and into 2004.

Looking back at labor market changes during the years following the 1996 welfare reform may inform current policy discussions. ERS research examined the effects of the movement of public assistance recipients into the labor force in the late 1990s, when the growing U.S. economy generated many new jobs—particularly jobs in low-skill occupations. New workers from public assistance programs accounted for 1 percentage point of real gross domestic product (GDP) growth during 1996-2000. Simultaneously, the large influx of former welfare recipients into the labor force affected the wages and employment opportunities of other low-skill workers. The reduction in wage growth was estimated to be 2.5 percentage points for low-skill workers. Wage growth was estimated to be 4.4 percent versus 6.9 percent without the influx of former welfare recipients. So, the actual wages of low-skill workers already in the workforce increased, but the increase was not as much as it would have been without the influx of new workers.



Ken Hammond, USDA

Public assistance caseloads since welfare reform



*2004 TANF caseloads as of March 2004.
Source: USDA's Food and Nutrition Service, and U.S. Department of Health and Human Services' Administration for Children and Families.

Kenneth Hanson, khanson@ers.usda.gov
Karen S. Hamrick, khamrick@ers.usda.gov

This finding is drawn from . . .

Moving Public Assistance Recipients Into the Labor Force, 1996-2000, by Kenneth Hanson and Karen S. Hamrick, FANRR-40, USDA/ERS, May 2004, available at: www.ers.usda.gov/publications/fanrr40/


Painet

Measuring U.S. Household Food Security

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USDA monitors the food security of the Nation's households through an annual, nationally representative household survey. Food security for a household means that all household members have access at all times to enough food for an active, healthy life. Food security is a foundation for a healthy, well-nourished population.

The food security survey is conducted annually by the U.S. Census Bureau as a supplement to its monthly Current Population Survey—the same survey that provides data for the Nation's monthly unemployment statistics and annual poverty rates. About 50,000 surveyed households respond to a series of questions about food expenditures, use of Federal and community food assistance programs, and behaviors and experiences known to characterize households having difficulty meeting their food needs.

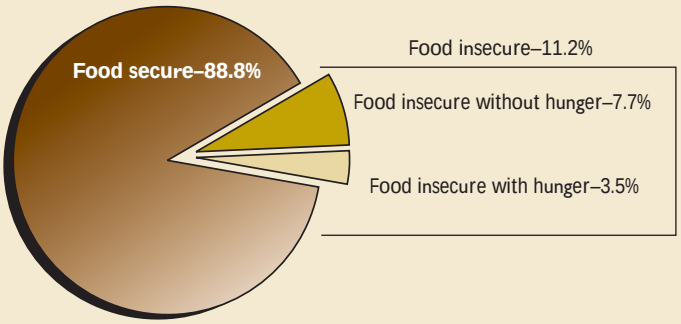
Households are classified as *food secure*, *food insecure without hunger*, or *food insecure with hunger* based on the number of food-insecure conditions reported. Households are classified as *food insecure with hunger* if their reported food-insecure conditions suggest that one or more household members was hungry at some time during the year because the household could not afford enough food. Households with children are further classified by whether any children were hungry at any time during the year because of the household's lack of money and other resources for food.

The annual food security survey data are the basis for an ERS series of reports. The data are also used in researching the causes of food insecurity and the role of USDA's food assistance programs in improving food security. The survey data (with all identifying information deleted to protect confidentiality) are made available to other researchers as public-use files to facilitate research on U.S. households' food security.

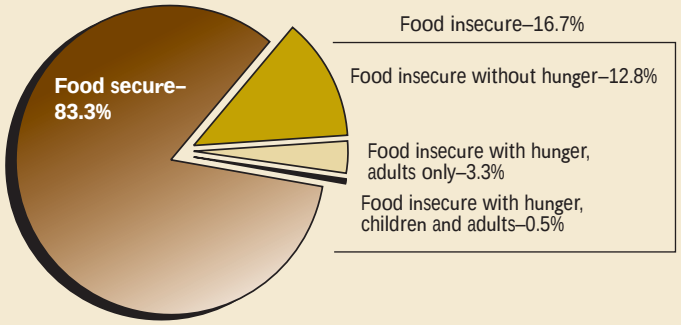
Nearly 90 percent of U.S. households were food secure throughout the entire year in 2003. About 11 percent of households had difficulty at some time during the year providing enough food for all their members due to a lack of money and other resources. Most food-insecure households obtained enough food to avoid hunger, using a variety of coping strategies, such as eating less varied diets, participating in Federal food assistance programs, or getting emergency food from community food pantries or emergency kitchens. But 3.5 percent of U.S. households were food insecure to the extent that one or more household members was hungry, at least some time during the year, because the household could not afford enough food.

In U.S. households, children—especially younger children—are usually protected from substantial reductions in food intake and ensuing hunger unless hunger among adults reaches quite severe levels. In 2003, only one-half of 1 percent of households with children were so severely food insecure that any of the children was ever hungry during the year. A substantially larger proportion (3.8 percent) had adult members who were hungry at times during the year because of their households' food insecurity.

U.S. households, by food security status, 2003



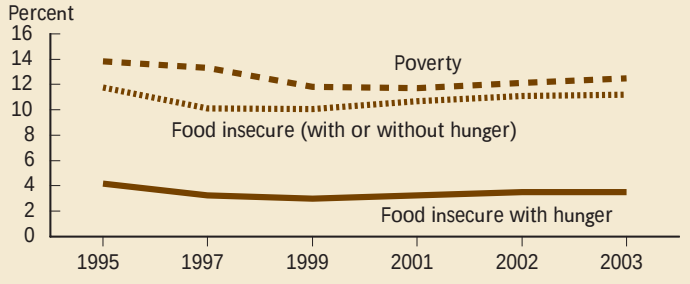
U.S. households with children, by food security status, 2003



Statistics for all charts were calculated by ERS using Current Population Survey Food Security Supplement data.

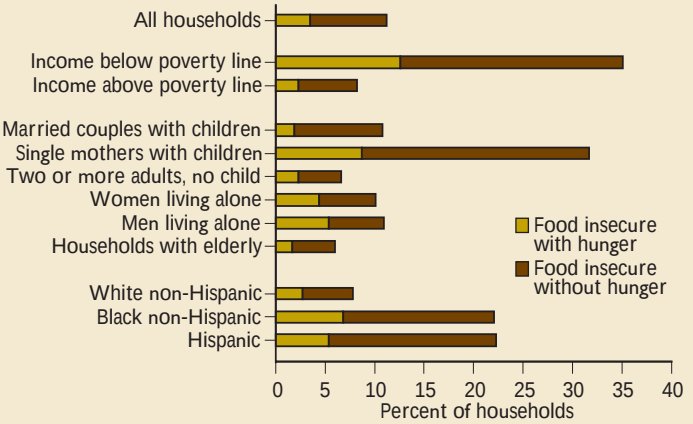
One of the Nation's health objectives, expressed in the U.S. Department of Health and Human Services' *Healthy People 2010* plan, is to reduce the prevalence of food insecurity to 6 percent, half of its 1995 level, by the year 2010. Food security in the U.S. improved from 1995, when it was first measured, through the late 1990s. Some of these gains were eroded following the 2001 recession. The prevalence of food insecurity differed from the poverty rate by only a few percentage points in each year since 1995. The similarity in levels of the two measures is consistent with the original concept of the poverty line—an income level at which households could just meet their basic needs for food and other essentials.

Prevalence rates of food insecurity, food insecurity with hunger, and poverty, 1995-2003



Food insecurity is strongly associated with household income. It is, by definition, a condition that arises from a lack of enough income and other resources for food. Thirty-five percent of poor households had difficulty putting enough food on the table at times during the year compared with 8 percent of households with incomes above the poverty line. Single mothers with children were especially vulnerable to food insecurity, as were Black and Hispanic households. Households with two or more adults but no children were more food secure than the national average as were households with elderly members.

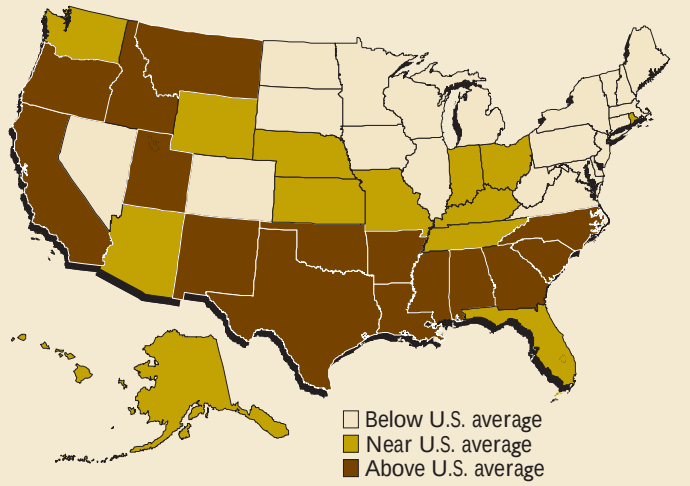
Prevalence of food insecurity by selected household characteristics, 2003



The prevalence of food insecurity was higher than the national average in 15 States and lower than the national average in 21 States and the District of Columbia. In the remaining 14 States, differences from the national average were small and not statistically significant. Research by ERS and others has shown that States with higher rates of food insecurity generally have the following characteristics:

- Higher than average poverty rate
- Higher than average unemployment rate or seasonally high unemployment
- High costs of housing and utilities relative to income
- High rate of residential mobility (a measure of how frequently people move)
- High proportion of the population under age 18

Prevalence of food insecurity, average 2001-03



This article is drawn from . . .

Household Food Security in the United States, 2003, by Mark Nord, Margaret Andrews, and Steven Carlson, FANRR-42, USDA/ERS, October 2004, available at: www.ers.usda.gov/publications/fanrr42/

For further information on the survey, food security measurement methods, food security reports, and food security research articles, visit the ERS Briefing Room on Food Security in the United States at: www.ers.usda.gov/briefing/foodsecurity/

Larry Lefever, Grant Heilman Photography

How Do U.S. Farmers Plan for Retirement?

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The approaching retirement of the baby boom generation has focused attention across all segments of society on issues related to retirement and succession planning. Government policies that can influence this planning and affect retirement income are of increased interest to policymakers. Recent tax initiatives have provided greater incentives for individuals to save for retirement. The Administration has announced that social security reform is among its highest priorities during 2005.

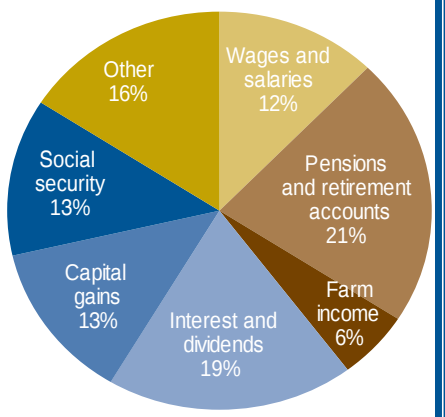
Retirement and succession planning are of considerable importance to farm households and there are good reasons to believe that they are affected by savings and retirement policies in ways that are different from the rest of the Nation's households. For example, compared with the U.S. labor force, farm operators are considerably older. Over one-fourth of all farmers, and about half of all agricultural landlords, are age 65 or older, compared with only about 3 percent of the overall labor force. Older age-group farm operators and landowners control over one-third of all farm assets and are staying in farming longer than previous generations. Improved health and longevity, combined with technological advances in farming equipment, enable farmers to continue to perform the physical tasks necessary to operate a farm much longer than was true for previous generations. Farming is also becoming popular as a part-time retirement activity.

In addition to working longer past traditional retirement age, farm operator households tend to have several income sources and different forms of wealth, as compared with the general population. Furthermore, because of the nature of the farm business, farm households have different savings habits and more diverse financial portfolios than most other U.S. households. Farm households' financial portfolios include more personal savings than those of the typical U.S. household and, in general, farm households are also less dependent on social security income during retirement.

Social Security Faces Potential Funding Shortfall

Social security is considered the foundation of the Nation's retirement income system and is important to the economic well-being of a large portion of the retired population. Social security operates on a pay-as-you-go basis, with current payroll taxes paying for the benefits of current retirees (see box, "Farmers' Participation in Social Security Varies"). In recent years, payroll taxes collected have exceeded benefits paid out. The excess is invested in Treasury securities held in a trust fund to pay future benefits. Over time, however, as baby boomers swell the retirement ranks, benefit obligations are projected to exceed payroll taxes, and trust fund assets could be drawn down and eventually exhausted unless changes are made to the current tax or benefit structure. The *2004 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds*, issued in March 2004, states that the trust fund reserves will be exhausted in 2042.

Farm operators receiving social security also receive income from other sources



Source: Internal Revenue Service, Individual Public Use Tax File, 1999.

Various incremental program changes have been suggested for addressing potential long-term social security funding shortfalls. These include increasing revenue by removing the cap on taxable earnings subject to the old-age portion of the tax, reducing benefits by indexing past annual earnings with changes in prices rather than wages, or increasing the retirement age to reflect the fact that individuals are living longer. The Administration has also proposed a new feature: the creation of personal investment accounts into which individuals would be permitted to divert a portion of their current payroll taxes.

In addition to social security, the retirement income system generally includes employer-sponsored pensions and personal savings. Only about half of the U.S. workforce is covered by private pensions, and the trend is away from pensions that provide a defined benefit to those that provide a benefit that depends upon employee contributions and earnings. In addition, many Americans have little or no private savings. In fact, social security benefits account for more than half of total income for over 60 percent of current social security recipients and are the sole source of income for about 20 percent of all recipients. In contrast, only about a third of farm operators currently collecting benefits receive more than half their income from social security. Among farm operators receiving social security benefits, on average, social security accounts for only about 13 percent of total income. Farm operator households that receive social security benefits also receive significant amounts of income from the farm, as well as from pensions, investment earnings, and income from the sale of both farm and nonfarm assets. The average annual social security benefit received by farm households in 1999 was about $12,300, slightly less than the $13,000 average for all U.S. households.

Farmers' Participation in Social Security Varies

Social security is financed through payroll taxes paid by employers and their employees, as well as by self-employed individuals. Because farmers often earn income from a variety of farm and off-farm activities, their participation in social security varies.

Currently, 12.4 percent of an employee's earnings up to $90,000 is paid in payroll taxes by the employee and employer (6.2 percent by each) to finance the social security system. An additional 1.45 percent is paid by both the employee and the employer to finance the Medicare, or hospital insurance, system. In 1999, farm operator households paid about $10 billion in social security taxes (considering both the employer and employee shares) on wages and salaries, primarily from off-farm employment.

Like other self-employed individuals, farmers are subject to the self-employment tax. The self-employment tax is essentially equivalent to the social security and Medicare taxes paid by employees and matched by the employer. The self-employment tax rate is 15.3 percent, consisting of two parts: 12.4 percent for social security (old-age, survivors, and disability insurance) and 2.9 percent for Medicare (hospital insurance). Farmers paid about $2 billion in self-employment taxes on farm and nonfarm self-employment income in 1999.

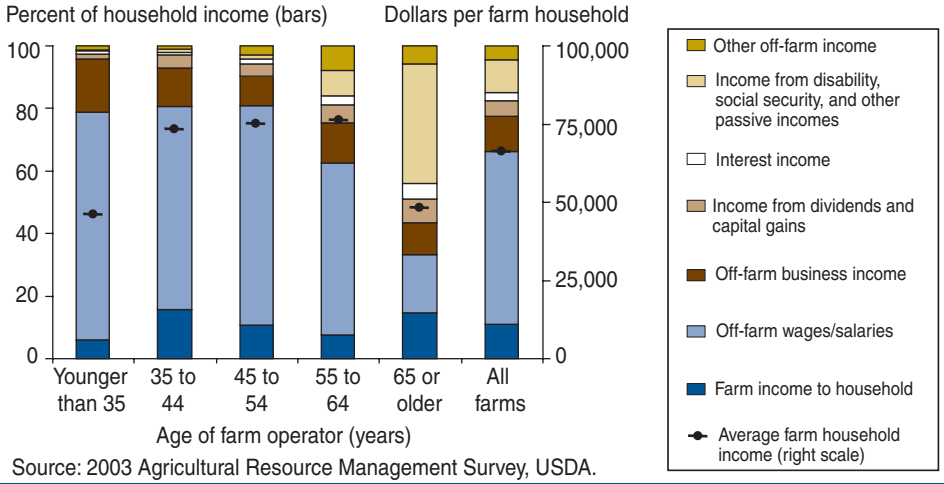
Participation in social security also varies by type of farm. For example, rural residence farm households participate in the social security system primarily through their off-farm employment and off-farm business ownership. Since many of these farm households report losses from farming, they pay little or no self-employment tax on farm income. On the other hand, intermediate and commercial farm operators are less likely to participate in the social security program through an off-farm job but instead contribute to social security through the self-employment tax on farm earnings.

Farmers Earn Income From a Variety of Sources . . .

Farm households earn income from both farm and off-farm sources. Off-farm income, which accounts for 90 percent of total farm household income, comprises income from off-farm businesses, wages and salaries, interest and dividends, and other sources, such as pensions, annuities, military retirement, unemployment, social security, veterans' benefits, other public retirement and public assistance programs, and rental income from nonfarm properties. In 2003, the average income for farm households, at $66,000, exceeded that of nonfarm households, at $59,100.

Among all farm households, those headed by operators age 55-64 have the highest income ($76,500). Farm operator households headed by operators age 65 or older receive $18,400, or about 38 percent of total household income, from disability insurance, social security, and other income sources (such as military and veterans' benefits, other public retirement and public assistance). However, among all U.S. households headed by persons age 65 or older, over 60 percent of total income ($30,400 in 2003) came from these sources.

Composition and level of income change dramatically for older farm households



Source: 2003 Agricultural Resource Management Survey, USDA.

. . .and Income and Wealth Vary by Age and Farm Type

The composition of farm households' sources of income varies with farm type. Rural residence farms (where the operator reports being retired or a primary occupation other than farming and gross farm sales are less than $100,000) and intermediate farms (operator reports farming as the major occupation and gross farm sales are less than $250,000) are more dependent on off-farm income than commercial farms (family-operated farms with gross sales in excess of $250,000). On the other hand, commercial farm operator households receive most—80 percent or more—of their income from farming. Commercial farm households tend to operate large farms, produce commodities that are covered under government programs (such as wheat, corn, cotton, and soybeans), and receive a larger share of government commodity program payments.

Household wealth may be acquired through savings, inheritance, or apprecia-

Tim McCabe, USDA

tion of household assets. Farm household net worth is measured by the value of combined farm and nonfarm assets (minus debt). Farm household assets are dominated by farm real estate (77 percent), while other physical assets (e.g., off-farm business investments, nonfarm real estate, off-farm houses, recreational vehicles) represent the biggest share of nonfarm assets (33 percent). Farm net worth tends to increase with the age of the operator. For example, the average net worth from farm assets increases from $251,800 for operators under age 35 to $580,000 for those age 65 and older. Similarly, the average net worth from nonfarm assets increases with age of the farm operator, but only up to age 64 ($287,700). It then declines as farm households liquidate assets to support consumption in older ages (65 or older, $202,600). The share of farm net worth to total farm household net worth varies with farm type. On average, farm net worth represents 61 percent of wealth for rural residence farm households, compared with 80 percent for intermediate, and 84 percent for commercial farm households.

On average, farm households have substantially higher wealth ($590,900) than all U.S. households ($359,400), but less than half that of all U.S. self-employed households ($1,258,000), with farm net worth contributing 70 percent of total farm household wealth. Farm household wealth also differs in composition from that of all U.S. households. The portfolio of assets held by farm households is heavily weighted toward farm business assets, while the largest shares among asset portfolios of all U.S. households are primary residences, stocks, and mutual funds.

Retiring farm operator households have substantial wealth as well. For example, the average net worth of farm operators who indicate that they will retire in the next 5 years is about $45,000 more than the average for all farm households. However, a large share of their wealth is in farm assets: average nonfarm net worth of those planning to retire is less than half the average for all farm households ($93,000).

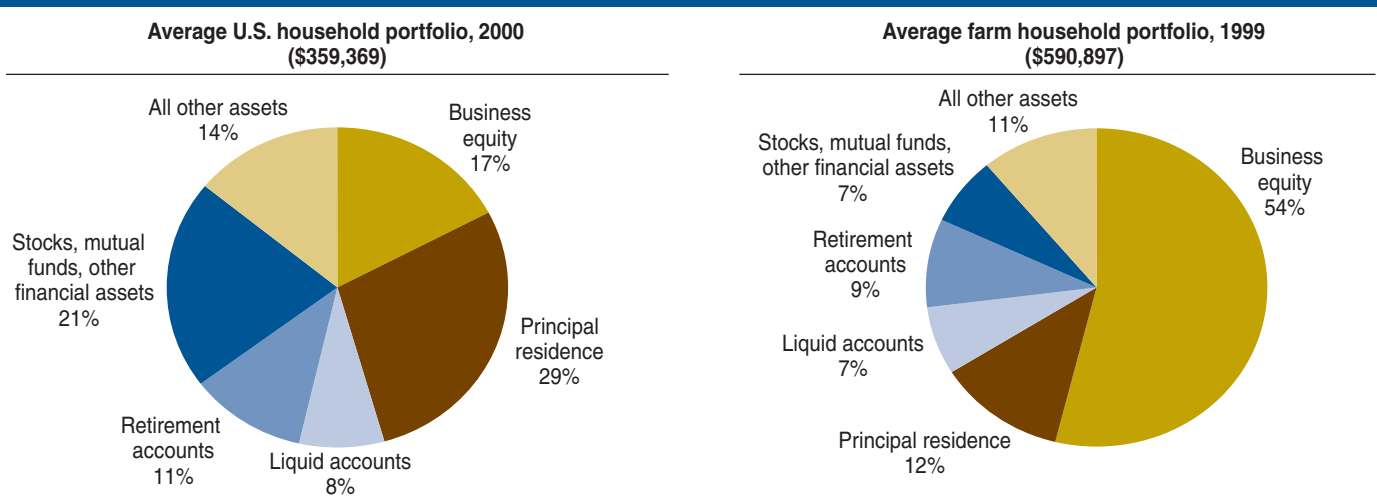
Farm Households Save and Invest for Retirement

More than 50 percent of farm households regularly target current income not used for consumption toward savings and other investment opportunities both on and off the farm. Additionally, 57 percent of farm families reported in 2003 that they are saving for long-term goals, such as retirement, education, or investment in financial markets. Such savings can also finance unexpected future needs, such as financial shortfalls in the farm business, or unexpected health care expenditures.

Farm households, like nonfarm households, have diverse financial portfolios, including assets not part of the farm business. One-fourth of the nonfarm assets are retirement savings accounts. Cash, checking, money market accounts, bonds, and certificates of deposit constitute less than one-fourth of nonfarm assets, as do stocks and mutual funds. The rest of nonfarm assets are held in real estate and businesses aside from the farm, off-farm houses, recreational vehicles, and other assets.

U.S. household retirement savings include both employer-sponsored retirement plans and individual retirement savings plans, such as IRA, 401(k), and Keogh accounts. Only 40 percent of farm households participate in some type of retirement account, compared with 60 percent of all U.S. households. Commercial farm operators are less likely to have an employer-sponsored pension and more likely to receive a larger share of their retirement income from farm assets.

Farm households have a more diverse portfolio of assets, with substantial business equity, than all U.S. households



Source: 1999 Agricultural Resource Management Survey, USDA, for farm households, and 2001 Survey of Consumer Finances for all U.S. households.

Participation rates in retirement savings accounts increase with both income and net worth. Participation is also more likely among families headed by persons under age 65.

Recent tax legislation has attempted to stimulate increased retirement savings. The Economic Growth and Tax Relief Reconciliation Act of 2001 increased the contribution limits for IRA and 401(k) accounts and allowed "catch-up" contributions from workers age 50 and over. While most U.S. taxpayers are eligible to contribute to an IRA, only about 3 percent of all taxpayers actually contribute. The rate for farmers is slightly higher, at about 7 percent. While many households not contributing to an IRA may participate in employer-sponsored retirement plans, many have neither an employer-sponsored plan nor an individual retirement arrangement.

According to data from the 1999 Agricultural Resource Management Survey and 2001 data from the Survey of Consumer Finances, the median values of retirement savings of farm households ($12,500) are larger than those of self-employed nonfarm households ($9,300) and are substantially larger than the median retirement savings of all U.S. households ($300).

The retirement savings pattern for farm households varies with income class, age of the farm operator, net worth, and income from the farm business. The majority of farm households earning $25,000 or more have retirement savings. Farm households with incomes of $100,000 or more have only half as much in retirement savings as self-employed nonfarm households with incomes of $100,000 or more. A similar pattern is observed for variations in net worth. Farm households at lower levels of net worth have more retirement savings than all other U.S. households but have a smaller value in retirement savings at the higher levels of net worth.

Retirement savings of farm, self-employed, and all nonfarm households, by selected characteristics[1]

Family characteristics	Retirement savings: Farm households	Retirement savings: Self-employed nonfarm households	Retirement savings: All U.S. households
	Median value of holdings (dollars)		
All families	12,500	9,300	300
Age of farm operator/head of household (in years)			
Less than 35	2,359	0	0
35-44	11,218	2,800	5,000
45-54	22,500	26,000	8,400
55-64	27,063	24,000	3,400
65 and older	4,500	16,500	0
Percentiles of net worth			
Less than 25[2]	0	0	0
25-49.9	17,500	500	0
50-74.9	25,144	30,700	6,000
75-89.9	32,500	136,250	42,000
90-100	45,000	275,000	125,000

[1]Retirement savings include IRAs, Keogh plan, 401(k).

[2]This represents the lowest quartile of farm households based on the total value of their net worth.

Source: 1999 Agricultural Resource Management Survey, USDA, for farm households, and 2001 Survey of Consumer Finances, Federal Reserve Board, for nonfarm households.

Eyewire (Money); PhotoSpin (Type); Corbis (Farmer)

Over a fourth of the principal operators of U.S. farm businesses are retired or planning to retire within the next 5 years.

Farmers Approaching Retirement Hold Onto Land

Retired and retiring farm operators account for over a fourth of the principal operators of U.S. farm businesses. Their succession decisions and retirement plans are of considerable importance to the farming community and the future structure of agriculture. Continuity of the family farm and the family farm sector is highly dependent on successful intergenerational transfer following the retirement of a farm operator. Intergenerational succession is especially pertinent for farmers who are planning to retire within the next 5 years. Of those operators planning to retire from farming, the average age is 62.

In contemplating retirement from farming, farm households must consider the future of the farm. Tax laws may encourage older farmers to hold onto their land and rent it out for retirement income. Despite reduced tax rates on capital gains associated with the appreciation in farmland values, the prospect of avoiding capital gains taxes on any appreciation prior to death continues to encourage farmland owners to hold the land. Recent changes in Federal estate tax policies that allow larger amounts of property to be transferred at death free of any estate tax further reinforce this incentive. Among farm operators who plan to retire from farming in the next 5 years, about a fifth report that they plan to rent out the farm, and another fifth plan to sell the farm. The remaining operators plan to turn over operations to others or convert their land to other uses. A substantial portion of the 87 million acres owned by the 42 percent of operators planning to either rent or sell their land will likely become available in farmland markets in the next few years.

Farmers Are Ready for Retirement

Farmers, like other employees and business owners, participate in and are eligible for benefits under the social security system. The levels of benefits to farm households are only slightly less than those for all other U.S. households. In addition, since many farmers remain active in farming well beyond retirement age, older farmers have income from a wide variety of sources and, as a result, fewer are dependent primarily upon social security for their financial well-being.

While fewer farm operators are covered by employer-sponsored pensions than are nonfarmers, a majority of farm operators save from current income on a regular basis and have accumulated diversified financial portfolios, including individual retirement savings. This is especially true for lower net worth farm households that have saved more than lower net worth nonfarm households. While higher net worth farm households have accumulated less retirement savings than all U.S. households, as a group these farm operators have accumulated substantial business equity that can be a potential source of retirement income to supplement social security and retirement savings.

This article is drawn from . . .

Income, Wealth, and Economic Well-Being of Farm Households, by Ashok Mishra, Hisham El-Osta, Mitchell Morehart, James Johnson, and Jeffrey Hopkins, AER-812, USDA/ERS, July 2002, available at: www.ers.usda.gov/publication/aer812/

"The Graying Farm Sector: Legacy of Off-Farm Migration," by Fred Gale, *Rural America*, Vol. 17, No.3, USDA/ERS, Fall 2002, available at: www.ers.usda.gov/publications/ruralamerica/ra173/ra173e.pdf

The Farm Households and Financial Well-Being chapter of the ERS Briefing Room on Farm Policy, Farm Households, and the Rural Economy, available at: www.ers.usda.gov/briefing/adjustments/farmhouseholds.asp

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North American Greenhouse Tomatoes Emerge as a Major Market Force

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The rapidly growing greenhouse tomato industry has become an important part of the North American fresh tomato industry. Greenhouse tomatoes now represent an estimated 17 percent of U.S. fresh tomato supply. Even though greenhouse tomatoes still constitute a minority share of the U.S. fresh tomato market, their influence is concentrated and growing in retail channels, which represent about half of U.S. tomato consumption. Around 37 percent of all fresh tomatoes sold in U.S. retail stores are now greenhouse, compared with negligible amounts in the early 1990s.

Greenhouse tomatoes can be seen as just one more development in a trend toward more differentiated fresh tomato offerings, including more variety in field-grown tomatoes. New types of tomatoes, improved varieties and handling, and positive health benefits associated with eating tomatoes have all contributed to a 30-percent rise in U.S. consumption of fresh tomatoes since 1985, with estimated 2003 annual per capita consumption levels around 8.8 kilograms (19.4 pounds). Growth in the greenhouse industry has challenged growers of fresh field tomatoes. With rising consumption of all tomatoes, field tomato sales in the U.S. retail market increased through 2001, in part due to new fresh field products, such as grape tomatoes. But in 2002, the combined retail sales volume of all field tomato types began to slip. Field tomatoes still dominate the growing foodservice market (restaurants, schools, hospitals, etc.) where greenhouse tomatoes are scarce. Foodservice sales are increasingly essential to the health of the field tomato industry.

While greenhouse tomatoes have higher per unit costs of production and generally higher retail prices than field tomatoes, several other characteristics have contributed to the growth in this sector. Since they are protected from weather and other conditions affecting open field production, greenhouse tomatoes generally have a much more uniform appearance than field tomatoes. They are also less prone to swings in production volumes. These factors lead to greater consistency in quality, volumes, and pricing—issues of particular concern to the retail and foodservice industries.

The United States, Canada, and Mexico have all developed major greenhouse industries. The United States is the largest North American market for greenhouse tomatoes, and U.S. imports from Canada and Mexico are larger than domestic production. In recent years, the growth in U.S. imports has exceeded the growth in U.S. production. In 2003, Canada accounted for an estimated 46 percent of U.S. imports of greenhouse tomatoes. Mexico's share was 45 percent. As the greenhouse tomato industry has transitioned from niche to mainstream status, it has become part of a more integrated North American market, following the pattern established by the field tomato industry.

The greenhouse industry is facing growing pains. With rapid growth in Canada and the United States during the 1990s, greenhouse tomato prices declined, causing financial problems for some growers. More recently, as the industry has expanded in Mexico, heterogeneity in production methods has increased. Growers in the United States and Canada, and some Mexican growers, have high-technology and high-cost greenhouses. Many of these growers view the growth of lower technology greenhouses and shade houses in Mexico with some alarm. This has led to a debate in the industry about how to define a greenhouse tomato (see box, "What Is a Greenhouse Tomato?"). Regardless of how this issue is resolved, higher expected year-round production volumes in Mexico portend greater competition in all seasons, and continued downward pressure on prices.

Eurofresh, Inc.


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What Is a Greenhouse Tomato?

There is no official USDA or Federal definition of a greenhouse tomato. Here, we define greenhouse tomatoes as those grown in fixed structures, as opposed to open fields or temporary structures, such as shade houses. Both shade houses and greenhouses are referred to as protected culture, offering advantages relative to open-field production. A shade house is a temporary structure that supports shade cloth, a type of screen that provides some passive environmental control, such as shading the plants from excessive sunlight and wind. Growers using fixed structures can choose the degree of environmental control to adopt and whether to grow in soil or use hydroponics, a production system where plants are grown in a nutrient solution with an artificial medium to provide mechanical support to the root system. Active environmental control could include heating, cooling, humidity control, and use of carbon dioxide to boost yields. Growers select technologies based on environmental and economic considerations.

All the large commercial greenhouses in the United States and Canada use active climate control and hydroponics, and many U.S. and Canadian growers would like to define a greenhouse tomato as one grown in that type of greenhouse. Although some greenhouse growers in Mexico have similar technology levels, others produce in greenhouses with lower technology systems, perhaps without fully active climate control, hydroponics, or both. Lower technology systems are less costly than high-technology greenhouses, but they produce lower yields and a less consistent product. However, this article uses a broader definition of greenhouses (not requiring active control and hydroponics) in order not to exclude expanding production volumes in Mexico. While this definition excludes shade houses, in reality all of protected culture will impact the North American fresh tomato industry, since shade houses are becoming more common in Mexican export-oriented field production regions, and it is becoming increasingly difficult to distinguish greenhouse and shade house production in the marketplace.

Seasonality Drives Market Integration

Seasonality is a major factor shaping the North American fresh tomato industry. Consumers increasingly demand a steady year-round supply of an ever-greater variety of tomato products. The greenhouse industry has seasonal production patterns similar to the fresh field industry, despite the fact that greenhouse production takes place indoors. Greenhouse supplies vary over time and across geographical regions, and marketers often try to extend their seasons to periods typically marked by lower tomato production and higher prices, sometimes by sourcing from more than one location. The result has been the development of an integrated North American greenhouse tomato industry that can provide the variety of tomato products that consumers demand throughout the year. While there is some overlap, Mexico is the primary foreign winter supplier to the U.S. market and Canada the primary foreign summer supplier.

In 2003, total production of North American greenhouse tomatoes was estimated at 528,078 metric tons. Canada's share of this total was 42 percent, followed by the United States with 30 percent, and Mexico with 28 percent. Though greenhouse tomato production soared in all three countries from the early 1990s, it has been stabilizing in the United States and Canada. In Mexico, the industry is still growing rapidly. Mexico's growing area exceeds the combined total area of U.S. and Canadian greenhouses, but with many Mexican growers using extensive production methods with relatively simple low-yielding technology, output is lower than in the other two countries.

Canada was the first big greenhouse tomato producer in North America and still has the highest yields and total production. The Canadian industry is centered in southern British Columbia and Ontario. Long, relatively mild, summer days in these regions generate high yields. During the March to December period, Canadian production is a market force. U.S. and Mexican tomato producers, both field and greenhouse, have to compete with the high Canadian summer volume.

The Achilles heel of the Canadian greenhouse tomato industry is its lack of winter supply. As greenhouse tomatoes have become a mainline commodity, retailers are increasingly demanding consistent year-round volumes from their suppliers. Given current greenhouse prices, it is uneconomical for most Canadian producers to provide light and

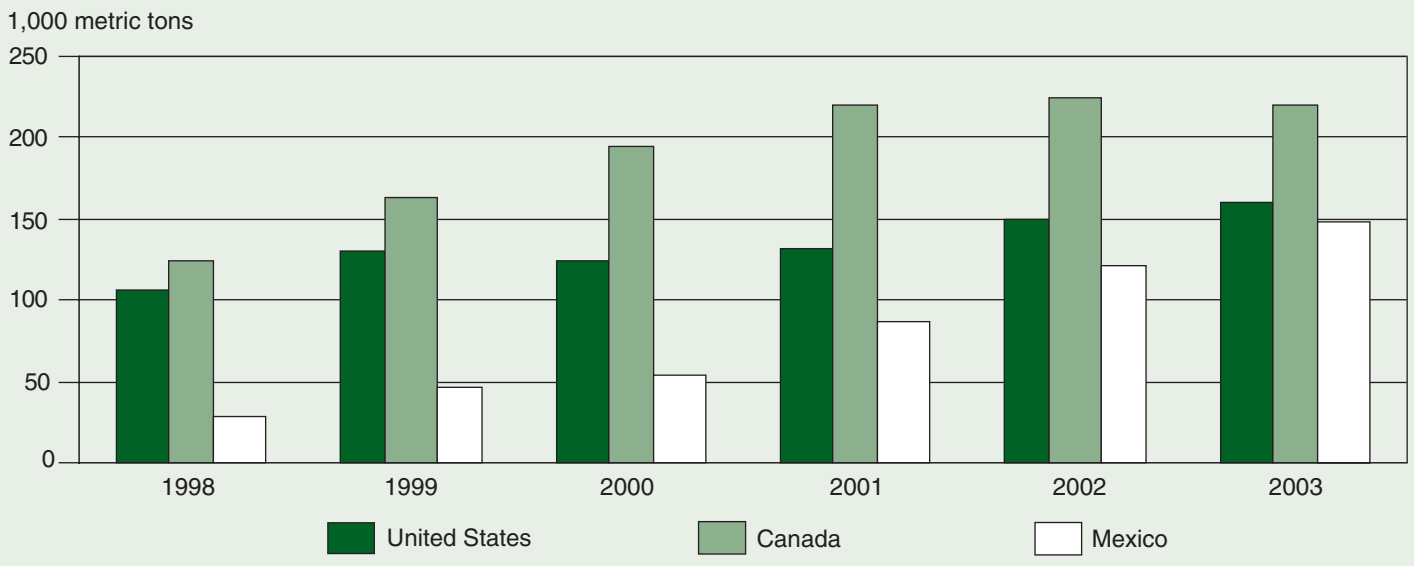
Canada leads North American greenhouse tomato production in 2003

Item	United States	Canada	Mexico	North America
Greenhouse tomato production (1,000 metric tons)	160	220	148	528
Greenhouse tomato area (hectares)	330	446	950	1,726
Average greenhouse tomato yield (metric tons/hectare)	484	494	156	378
Fresh field tomato production, excluding processing (1,000 metric tons)	1,594	27	1,804	3,425
Average fresh field tomato yield (metric tons/hectare)	32	15	28	25
Greenhouse share of total fresh production, by country (percent)	9	89	8	13
Estimated greenhouse exports to U.S. (1,000 metric tons)[1]	NA	130	126	256

[1]Official imports of greenhouse tomatoes are thought to be underreported for Mexico due to tariff code misclassification; 58,357 metric tons of greenhouse tomato imports from Mexico were reported by the U.S. Department of Commerce in 2003. The figure shown here includes estimated additional miscoded imports, based on information from industry sources obtained by Cook and Calvin. This figure may include some production from shade houses.
NA=Not applicable.

Sources: Statistics Canada, Ontario Greenhouse Vegetable Producers' Marketing Board, British Columbia Vegetable Marketing Commission, U.S. Department of Commerce, interviews by Cook and Calvin, USDA's National Agricultural Statistics Service, USDA's Foreign Agricultural Service.

North American greenhouse tomato production



Sources: Statistics Canada, Ontario Greenhouse Vegetable Producers' Marketing Board, British Columbia Vegetable Marketing Commission, and interviews by Cook and Calvin.

heat for winter production. To better serve their customers, Canadian marketers supplement their winter supply by sourcing from U.S. and Mexican producers. But this pattern could change. More Mexican producers may become year-round suppliers and decide to market their tomatoes independently. Foreign direct investment in growing operations could become more common as a strategy for controlling supply. For example, one large British Columbia grower built a greenhouse in California to help supplement winter supplies.

Much of the U.S. greenhouse tomato industry began in the northeast in the early 1990s, with production in the same months as Canadian producers.

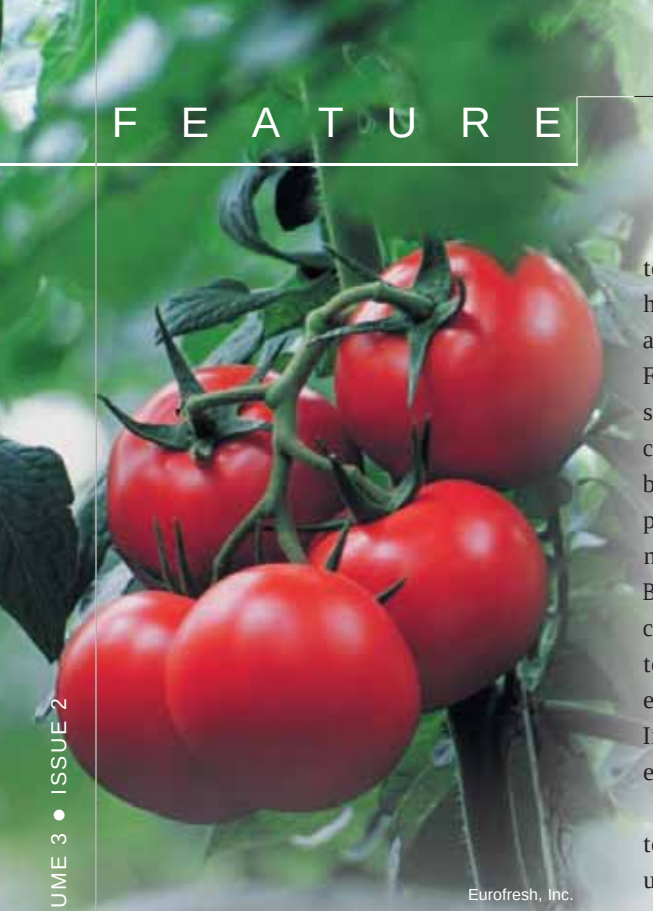
Greenhouse production spreads to achieve year-round supply

Eventually, several producers moved west and south, lured by the prospect of producing tomatoes year-round and capturing a slice of the high-priced winter market. The four largest greenhouse tomato firms in the United States are now located in Arizona, Texas, Colorado, and coastal southern California, and account for 67 percent of domestic production. Smaller greenhouses are located throughout the United States but these are frequently seasonal producers and local marketers. The profitable winter market helps the year-round U.S. producers withstand the very low prices during the summer season when Canadian volume inflates supplies. However, southwestern greenhouses face special challenges posed by the summer heat and often need expensive cooling systems to produce high-quality tomatoes. Furthermore, expanding winter production in Mexico will likely reduce greenhouse tomato prices and increase competitive pressure on year-round U.S. growers.

The Mexican greenhouse tomato industry is the fastest growing in North America and the most varied. In Mexico, large field tomato grower-exporters in Sinaloa on the northwest coast and the Baja California peninsula are experimenting with protected culture, either shade houses or greenhouses, near their field operations. In contrast, U.S. field tomato growers usually have no connections to the greenhouse industry. This gives Mexican growers a foot in both camps and potentially reduces market and other types of risk. Because of its hot, humid summers, Sinaloa, the principal fresh field tomato-exporting region in Mexico and a leading greenhouse exporter, is a winter producer only. Growers there have less incentive to invest in the highest technology greenhouses because the limited shipping season reduces the return on investment. Nevertheless, the technology levels and yields in coastal areas are improving, with more growers moving into midlevel technology systems to improve yields, quality, and marketing.

Several clusters of greenhouses are also emerging in temperate, higher altitude areas in central and north central Mexico, and in Imuris in northern Sonora, near the U.S. border. With the exception of those in Imuris, most of these firms are new entrants to agriculture and have no connection with field tomato growers. Their advantage is the ability to produce year-round, in some cases with investment in summer cooling required. As a result, more growers in these areas are investing in high-technology greenhouses similar to those in Canada and the United States. As greenhouse production in temperate, noncoastal areas expands, Mexico will become more of a competitive force in all seasons.

The Mexican greenhouse tomato industry has both advantages and disadvantages over the U.S. and Canadian industries. Mexico's major advantage is its ability to produce during the winter months—the same edge it holds in field tomato production. Its major disadvantage is the much higher cost of capital, a problem given the capital-intensive nature of greenhouse production. As a result, many growers find it difficult to invest in technologies that generate the best yields and consistent quality. Mexico is also hampered by lack of local greenhouse input industries, public research, and experienced management. High heating costs in many temperate locations are also a problem. Although hourly labor rates are much lower in Mexico, typically lower labor productivity means that total labor cost savings are less than the differential in labor rates. Overall, at this stage, Mexico's greenhouse tomato industry does not appear to have a clear advantage in unit costs.



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Greenhouse Tomato Prices Falling

Despite rising demand for greenhouse tomatoes, the industry is facing downward price pressures, as demand growth has sometimes been outpaced by expanding supply. Two periods of very low producer prices had significant effects on the industry. In 1999, low grower prices for beefsteak tomatoes (a large, round, red tomato and the leading greenhouse product at the time) stung growers who had invested in greenhouses when prices were much higher. In response, greenhouse expansion faltered and some less profitable greenhouses were closed. Growers diversified their product mix by shifting to more tomatoes-on-the-vine, or cluster tomatoes. Between 1999 and 2003, the share of beefsteak tomatoes in the total retail quantity sold of fresh tomatoes fell from 18 to 13 percent, while the share of cluster tomatoes rose from 13 to 24 percent. But the rapid growth of cluster tomatoes led to overproduction in this segment and extremely low prices by the summer of 2004. The price drop is slowing further expansion in cluster tomatoes.

Production of the leading greenhouse tomato products—beefsteak and cluster—has now grown to the point where they are becoming mainstream commodities. For specialty niche products with limited supply, it is generally easier to command consistently high prices, in part because buyers place less emphasis on aggressive price negotiations for products that are not major contributors to the bottom line. But sales of greenhouse tomatoes are now critical to the profitability of overall retail tomato sales, and prices play a more influential role in purchasing transactions. Increasing competition drives down grower margins.

As the industry matures, greenhouse tomato growers strive for continual product innovation as a strategy for adding value, stimulating consumer interest, and maintaining margins and profitability. The expanding product line currently consists of smaller cluster tomatoes (such as cocktail tomatoes, including Campari), roma and mini roma cluster tomatoes, heirloom, and different-colored tomatoes. Greenhouse tomato producers tend to be closer to the pulse of consumers because they market a retail- and consumer-ready product. In addition, they increasingly market directly to retailers, rather than through intermediaries, such as repackers and wholesalers, as is the case for most field tomato shippers.

Impacts on Field Tomatoes Mixed

Competition from greenhouse tomatoes has brought major changes in the quantity and composition of field tomato sales. While total retail quantity sold of all fresh tomatoes increased from 1999 to 2003, the volume of field tomatoes declined after 2001, with the share falling from 69 to 63 percent. Over the same years, the share of all round tomatoes (mature green and vine ripe) declined from 43 to 31 percent (see box, "Field Tomato Variety Expands"). The roma share fell from 23 to 19 percent, but the grape and cherry category grew from 3 to 13 percent. Most grape and cherry tomatoes are field grown, mitigating the impact of greenhouse tomatoes on the field-grown category. Within the declining round category, the share of mature green tomatoes fell from 78 to 39 percent, with vine ripe tomatoes benefiting.

While mature green tomatoes are being forced out of the retail market by competition from both greenhouse and other field tomato types, they still dominate the expanding foodservice market, which represents about half of U.S. tomato consumption. With declining retail sales, the mature green industry is increasingly dependent on the foodservice market, where greenhouse tomatoes have not yet made significant inroads. However, this could change since some greenhouse firms have recently begun to experiment with developing an acceptable product for foodservice users.

If foodservice demand falters, mature green tomato growers would need to consider other alternatives, with serious industry structural adjustments likely. Growers could continue to attempt to reposition field tomatoes through new varieties, products, and packaging with more commercial appeal. Alternatively, the industry could diversify into the greenhouse industry, either through alliances with existing producers or through direct investment. However, greenhouse tomato production is very capital- and technology-intensive, creating barriers to entry. In addition, the rapid greenhouse expansion in the United States was accompanied by mixed profitability results; thus, most field tomato growers did not consider the greenhouse industry an attractive alternative. But recent profitability in the California field industry caused by weather-induced high prices may provide the financial where-

Field Tomato Variety Expands

There are two types of round field tomatoes—mature green and vine ripe. Mature green tomatoes are the backbone of the U.S. fresh field tomato industry and are the major type of tomato grown in Florida and California, with minimal production in Mexico. They are harvested at an early stage; while still green, they are sufficiently mature to ripen after harvest when treated with ethylene gas, the plant's natural ripening agent. Mature green tomatoes are firm, have a long shelf-life, and slice well. They are also one of the lower cost tomatoes. Mature green tomatoes are the dominant tomato in food service, particularly in the fast food industry.

Vine ripe tomatoes are harvested at a slightly riper stage and ripen fully without ethylene treatments. During the winter, most of the vine ripe tomatoes consumed in the United States come from Mexico, with Florida as a minor supplier. During the summer, southern California and Baja California are the main suppliers. Mexican round tomato exports are almost entirely vine ripe. While the vine ripe tomato may appeal to some high-end foodservice firms, most sales have traditionally been to the retail market, in part due to a generally higher cost than mature greens. However, with short supplies of mature green tomatoes in fall 2004, foodservice buyers were more willing to try other types of tomatoes as substitutes. This may lead to shifting foodservice preferences over time.

Fresh roma tomatoes (also known as plum tomatoes) grew rapidly in the 1990s, in part due to retail demand from the expanding Mexican consumer segment, and more recently due to their expanding use in foodservice menus. They are grown primarily in Mexico, with California and Florida also garnering part of this market.

Other types of field tomatoes growing in popularity include such specialties as cherry, grape, pear, organic and heirloom tomatoes (older, often misshapen, varieties recognized for their flavor). While some of these tomatoes are grown in greenhouses, most are field grown. Grape tomatoes, in particular, represent a very important new product offering in field tomatoes.

withal for some field growers to explore greenhouse production. If they were to invest, they would be new entrants in a maturing industry.

Greenhouse and Field Tomato Market Interactions Increase

In the early days of the evolution of greenhouse tomatoes, the greenhouse and field tomato sectors operated on a relatively independent basis. Now that they are a major market force, greenhouse tomatoes are increasingly influenced by supply and demand trends in the fresh field tomato industry, and vice versa.

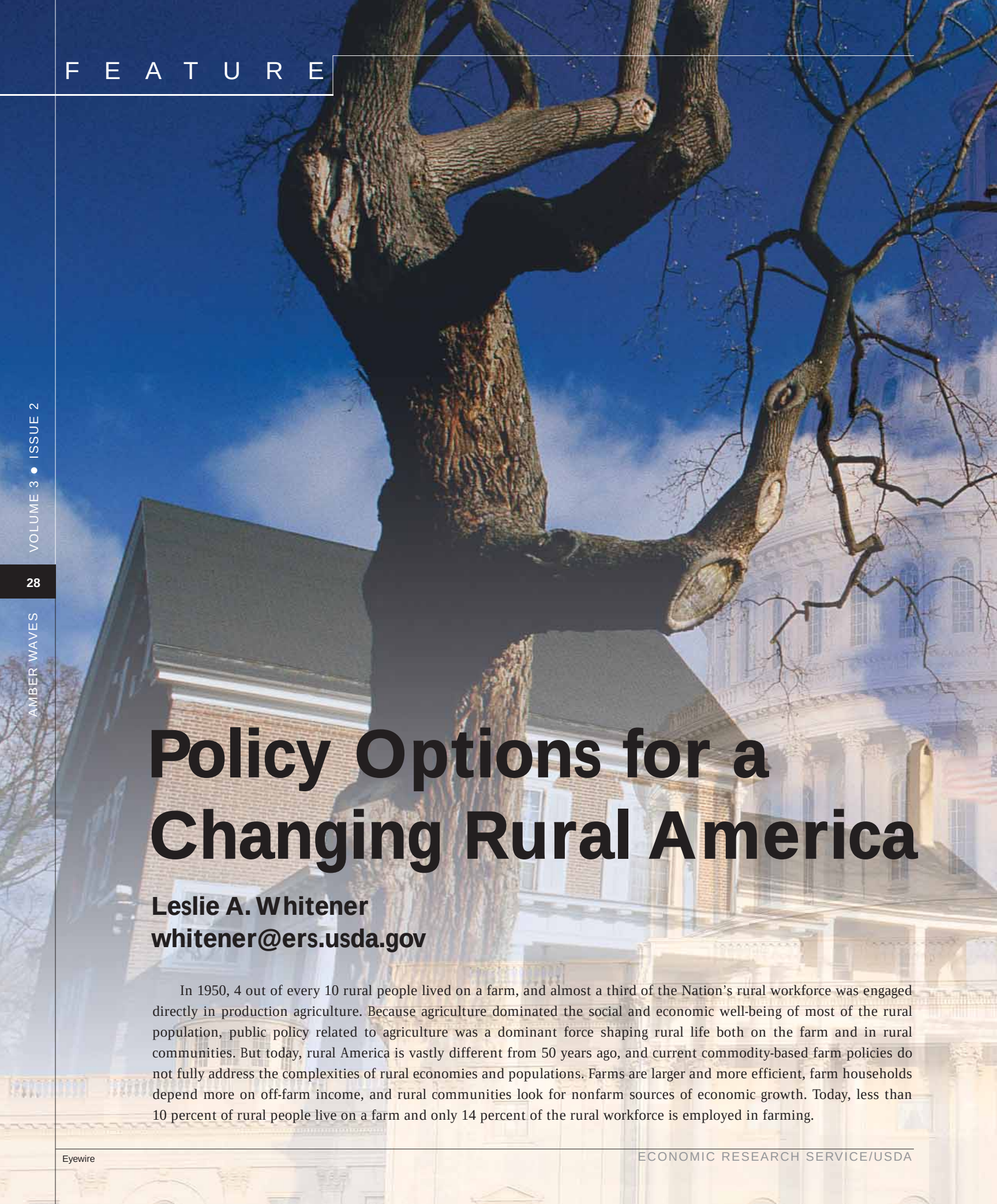
In fall 2004, a weather-induced period of short supplies of fresh field tomatoes enabled greenhouse producers to benefit from a brief period of extraordinarily high prices as buyers substituted greenhouse for field tomatoes, where possible. In contrast, earlier in summer 2004, a record-high supply of greenhouse tomatoes caused greenhouse prices to decline, making them even more attractive to retail buyers, and placing a damper on demand for fresh field tomatoes. With greater supply has come an increased willingness on the part of consumers, retailers, and foodservice users to experiment with tomato types.

Developments in Mexico Will Shape the Future

Notwithstanding brief periods of abnormally high prices, average grower prices for greenhouse tomatoes have been trending downward. If this trend continues, some parts of the North American greenhouse tomato industry may become less viable. Growers will continue to seek the lowest cost production regions and form marketing alliances to build year-round supply. Greater competition means that new entrants have less room for error; the learning curve is shorter than in the 1990s, when the industry was in its infancy and average prices were higher. The greatest source of uncertainty for the future of the North American greenhouse tomato industry will be the changing structure of the Mexican industry, which is still seeking out the best locations, technology packages, and management practices. U.S. and Canadian growers will be following developments in Mexico closely when making their future investment and marketing decisions.

This article is drawn from . . .

Greenhouse Tomatoes Change the Dynamics of the North American Fresh Tomato Industry, by Roberta Cook and Linda Calvin, ERR-2, USDA/ERS, April 2005, available at: www.ers.usda.gov/publications/err2/



Policy Options for a Changing Rural America

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In 1950, 4 out of every 10 rural people lived on a farm, and almost a third of the Nation's rural workforce was engaged directly in production agriculture. Because agriculture dominated the social and economic well-being of most of the rural population, public policy related to agriculture was a dominant force shaping rural life both on the farm and in rural communities. But today, rural America is vastly different from 50 years ago, and current commodity-based farm policies do not fully address the complexities of rural economies and populations. Farms are larger and more efficient, farm households depend more on off-farm income, and rural communities look for nonfarm sources of economic growth. Today, less than 10 percent of rural people live on a farm and only 14 percent of the rural workforce is employed in farming.

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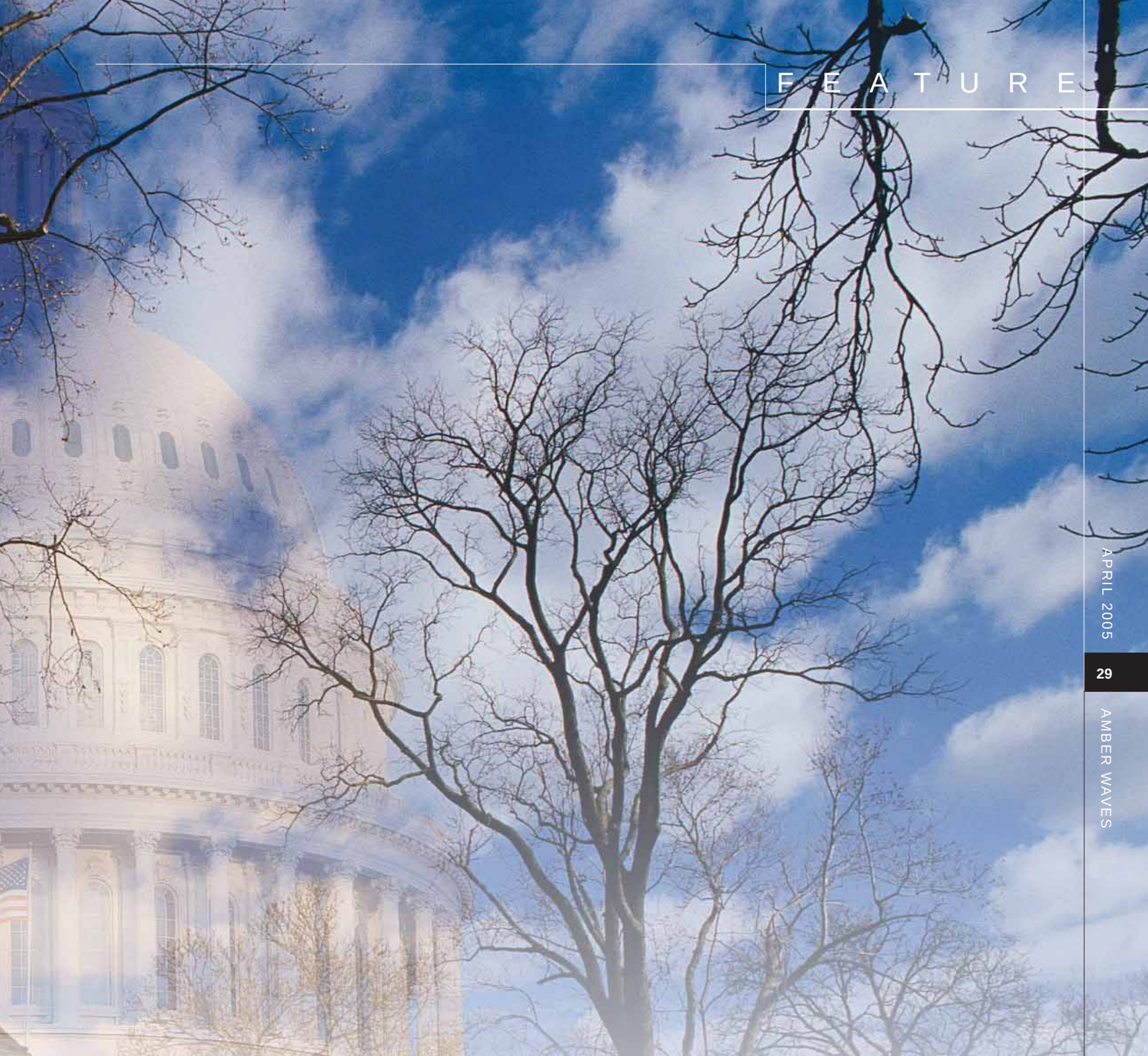


In addition, some rural communities have changed dramatically since 1990 due to increased population from urban areas, shifts in age and ethnic composition, and economic and industrial restructuring. Population changes are creating new needs as new migrants from urban areas revitalize some nonmetropolitan (nonmetro) or rural areas, while long-term population and employment losses have the opposite effect on other rural communities. Increasing competition from abroad and sectoral shifts in employment present new challenges and opportunities in the worldwide economy and raise the question—how can rural communities successfully build on their economic base and other assets to retain and attract population and employment? And, when, where, and under what circumstances will rural development strategies be most successful? The diversity within rural America dictates that strategies tailored to particular types of rural economies may be more effective than a broader "one size fits all" rural policy. Demographic change, the health of the Nation's economy, and industrial restructuring will be major factors affecting rural policy in the 21st century.

Changing Demographics Suggest Different Policy Needs

Overall rural population growth rebounded in the 1990s, increasing by over 10 percent, up from 3-percent growth in the previous decade. Migration continued to fuel rapid population growth in some nonmetro counties, especially in scenic areas and along the metro periphery. However, population growth began to slow at mid-decade, and the number of nonmetro counties that have lost population has climbed from around 600 counties during the 1990s to well over 1,000 since 2000. While population loss affects all regions, it is particularly widespread in the Great Plains, a region that depends heavily on farming (see box, "The 2004 ERS County Typology"). Many of these counties also lost population in the 1980s (see "Population Loss Counties Lack Natural Amenities and Metro Proximity" on page 8). Maintaining the population base, improving off-farm job opportunities, and providing public services continue to be long-term challenges for many traditionally farming areas.

Hispanics are the fastest growing racial/ethnic group in rural America.

LifeSTOCK Photos

The 2004 ERS County Typology

ERS has recently developed county typologies to measure broad patterns of economic and social diversity for developing public policies and programs. The 2004 County Typology classifies all U.S. counties according to seven overlapping categories of policy-relevant themes and six non-overlapping categories of economic dependence.

Policy types:

Housing stress (537 total, 302 nonmetro) counties are those where 30 percent or more of households had one or more of these housing conditions in 2000: lacked complete plumbing, lacked complete kitchen, paid 30 percent or more of income for owner costs or rent, or had more than 1 person per room.

Low-education (622 total, 499 nonmetro) counties are those where 25 percent or more of residents age 25 to 64 had neither a high school diploma nor a GED (General Educational Development) diploma in 2000.

Low-employment (460 total, 396 nonmetro) counties are those where less than 65 percent of residents age 21 to 64 were employed in 2000.

Persistent poverty (386 total, 340 nonmetro) counties are those where 20 percent or more of residents were poor as measured by each of the last four censuses (1970, 1980, 1990, and 2000).

Population loss (601 total, 532 nonmetro) counties are those where the number of residents declined both between the 1980 and 1990 censuses and between the 1990 and 2000 censuses.

Nonmetro recreation (334 designated nonmetro in either 1993 or 2003, 34 designated metro in 2003) counties were classified using a combination of factors, including share of employment or share of earnings in recreation-related industries in 1999, share of seasonal or occasional use housing units in 2000, and per capita receipts from motels and hotels in 1997.

Retirement destination (440 total, 277 nonmetro) counties are those where the number of residents age 60 and older grew by 15 percent or more between 1990 and 2000 due to inmigration.

Economic types:

Farming-dependent (440 total, 403 nonmetro) counties are those with either 15 percent or more of average annual labor and proprietors' earnings derived from farming during 1998-2000 or 15 percent or more of residents employed in farm occupations in 2000.

Mining-dependent (128 total, 113 nonmetro) counties are those with 15 percent or more of average annual labor and proprietors' earnings derived from mining during 1998-2000.

Manufacturing-dependent (905 total, 585 nonmetro) counties are those with 25 percent or more of average annual labor and proprietors' earnings derived from manufacturing during 1998-2000.

Federal/State Government-dependent (381 total, 222 nonmetro) counties are those with 15 percent or more of average annual labor and proprietors' earnings derived from Federal and State Government during 1998-2000.

Services-dependent (340 total, 114 nonmetro) counties are those with 45 percent or more of average annual labor and proprietors' earnings derived from services (SIC categories of retail trade; finance, insurance, and real estate; and services) during 1998-2000.

Nonspecialized (948 total, 615 nonmetro) counties are those that did not meet the dependence threshold for any one of the above industries.

The ERS County Typology has been featured in several *Amber Waves* articles:

"One in Five Rural Counties Depends on Farming," by Linda Ghelfi and David McGranahan, *Amber Waves*, Vol. 2, Issue 3, June 2004.

"Persistent Poverty Is More Pervasive in Nonmetro Counties," by Dean Jolliffe, *Amber Waves*, Vol. 2, Issue 4, September 2004.

"One in Four Nonmetro Households Are Housing Stressed," by James Mikesell, *Amber Waves*, Vol. 2, Issue 5, November 2004.

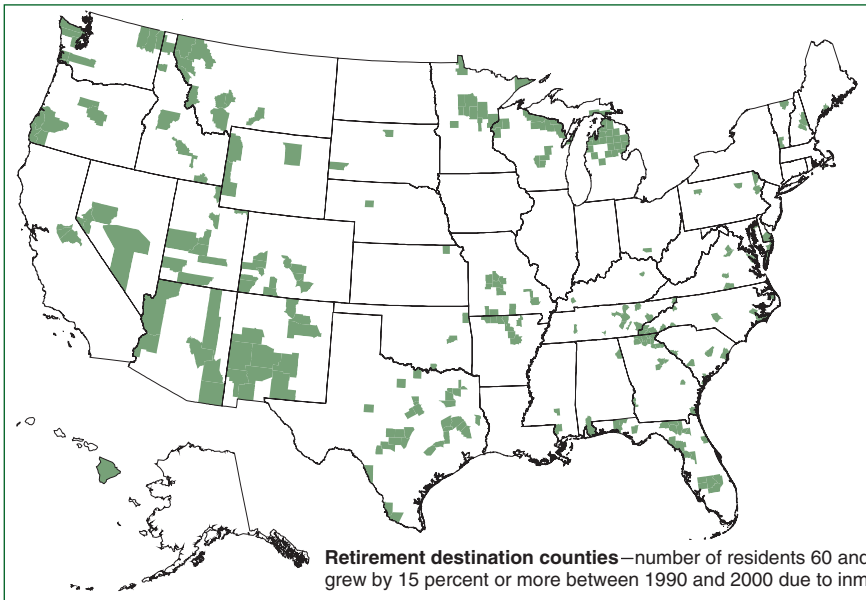
"Job Losses Higher in Manufacturing Counties," by Tim Wojan, *Amber Waves*, Vol. 3, Issue 1, February 2005.

"Population Loss Counties Lack Natural Amenities and Metro Proximity," by John Cromartie, *Amber Waves*, Vol. 3, Issue 2, April 2005.

Growing numbers of Hispanics are settling in rural America, accounting for over 25 percent of nonmetro population growth during the 1990s. With a younger population and higher fertility, Hispanics are now the fastest growing racial/ethnic group in rural America. And, almost half of all rural Hispanics live outside of the traditional settlement States in the Southwest. In many places, new Hispanic settlement patterns are contributing to the revitalization of small towns; in others, the influx of residents is straining housing supplies and other community resources. In addition, the younger age, lower education, and large family size of Hispanic households suggest increased demands for social services, including prenatal care, child care, and education programs.

The older population grew rapidly in many rural places in the 1990s, due largely to retirement and recreation opportunities. Nonmetro retirement-destination counties, where the number of residents age 60 and older grew by 15 percent or more between 1990 and 2000 due to inmigration, were located predominantly in the West, and in major retirement centers throughout the South, including Texas and Florida. In the rural agricultural areas of the Great Plains and Corn Belt, as well as in rural parts of the lower Mississippi Delta, the growth of the older population slowed and in many places stopped altogether. This pattern reflects the small size of the cohort now reaching age 65, a group that was depleted in many rural areas by low birth rates in the 1930s, an exodus to cities in the 1940s, and an exit from farming in the 1950s. These dual patterns of growth and decline suggest the need for different strategies. Areas with rapidly increasing older populations must be prepared to provide essential services, resources, and programs for the elderly. Areas with declining elderly populations must consider economies of scale when ensuring that necessary services are available and accessible.

Nonmetro retirement destination counties, 2000



Retirement destination counties—number of residents 60 and older grew by 15 percent or more between 1990 and 2000 due to inmigration.

Prepared by ERS using data from the U.S. Census Bureau.

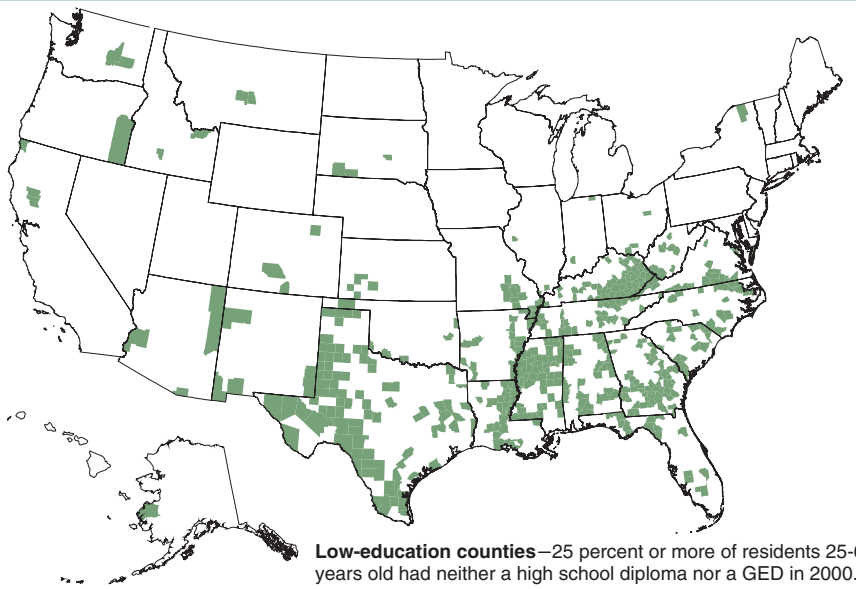
The educational attainment of rural Americans is higher than ever before, continuing a long upward trend. In 2000, nearly one in six rural adults had a 4-year college degree, about twice the share of a generation ago. But the substantial growth in the college-educated population was not evenly distributed across rural areas, and low education levels still challenge much of rural America. Low-education counties, with 25 percent or more of residents age 25 to 64 who had not completed high school, are concentrated in the South and Southwest. Low-wage resource-based and manufacturing economies in many of these counties limit the kind of high-skill job growth that attracts a higher educated labor force. Strategies for raising educational levels and the quality of that education are essential to improving the economies of many rural communities.

The Rural and National Economies Are Linked

Rural areas as a whole shared in the Nation's economic prosperity during the 1990s. The nonmetro unemployment rate fell to its lowest level (4.4 percent in 2000) in 20 years, and rural poverty rates reached an all-time low (13.4 percent in 2000). But in late summer 2000, the manufacturing industry went into a downturn, and by March 2001, the longest U.S. economic expansion on record had ended. Unemployment and poverty rates subsequently rose in both rural and urban areas, while employment and earnings grew sluggishly.

The U.S. economic recovery began in November 2001, and by the beginning of 2004 had become broad-based, with most domestic sectors exhibiting moderate to strong growth. Metro employment grew by 0.5 percent from 2002 to 2003, while nonmetro employment grew by 0.6 percent. But economic recovery has been uneven across rural America, with most gains concentrated in the high population growth areas of the South and the West. Areas of the Northwest continue to

Nonmetro low-education counties, 2000



Low-education counties—25 percent or more of residents 25-64 years old had neither a high school diploma nor a GED in 2000.

Prepared by ERS using data from the U.S. Census Bureau.

wrestle with declining employment in timber and other natural resource industries. The employment picture for the Great Plains and Midwest was mixed, with some rural areas buoyed by employment gains of at least 2 percent and others mired in long-term declines in population and employment.

Industrial Restructuring Creates New Opportunities and Challenges

The rural economy has shifted from a dependence on farm-based jobs to a dependence on nonfarm-based jobs. Today, four out of five rural counties are dominated by nonfarm activities, including manufacturing, services, mining, and government operations. In many of these counties, however, agriculture is still a major source of income. For farming-dependent rural counties—located primarily in the Great Plains and accounting for 10 percent of farm operators and 21 percent of total farm cash receipts in 2000—the challenge is not a weak agricultural economy. Rather, these counties have not been equally prosperous as others because nonfarm sector development is limited by remoteness from major urban markets and low population densities.

Other nonmetro economies depend more on industries, such as manufacturing, for their economic base. Almost 30 percent of all nonmetro counties were dependent on manufacturing, having derived 25 percent or more of average earnings from manufacturing during 1998-2000. Manufacturing has traditionally located in rural areas to take advantage of lower labor and land costs. Since the late 1980s, some manufacturers, competing on the basis of low-cost production, shifted their production overseas. Other manufacturers took advantage of new technologies and management practices and began to compete on the basis of product quality. This shift resulted in a need for more highly skilled labor, and manufacturing moved to rural areas with better schools and fewer high school dropouts. Areas with low high school completion rates, located predominantly in the South, now face greater difficulties in attracting and retaining manufacturing employers. The manufacturing counties of the rural Great Plains offer a more educated labor force, and these areas have been most attractive to employers. But, the loss of 2.6 million manufacturing jobs nationwide since 2000 suggests that manufacturing counties as a whole may be especially hard pressed to find alternative sources of economic growth.

Rural Policy Options for the Future

The goals of economic/community development programs and policies in rural areas vary widely, as do the resources and the opportunities and challenges communities face. Some areas will focus on strategies to stimulate economic and community growth to help address problems associated with population and employment decline. Other areas will seek to improve wages and living standards by changing the nature of employment, or by enhancing infrastructure and public services. Low-density settlement patterns often make it more costly for communities and businesses to provide critical public services. In contrast, other rural areas, particularly those rich in natural amenities, face growing pains borne out of economic transformation and rapid population increases. Community leaders in these areas are struggling to provide new roads, schools, and other community services and may actually want to stem growth in order to limit rural sprawl.

One point is clear—commodity-based farm policies as currently structured do not fully address the complexity of issues facing rural economies and populations. For example, the high level of farm payments in the late 1990s did little to eliminate the long-term outmigration from farming areas. ERS research shows that counties highly dependent on farm payments had some of the highest rates of population loss, even during periods when most other rural areas were gaining population.

Rural policy for the future will need to encompass a broader array of issues, and these different rural issues will require different mixes of solutions. Strategies to generate new employment and income opportunities, develop local human resources, and build and expand critical infrastructure hold the most promise for enhancing the economic opportunities and well-being of rural America.

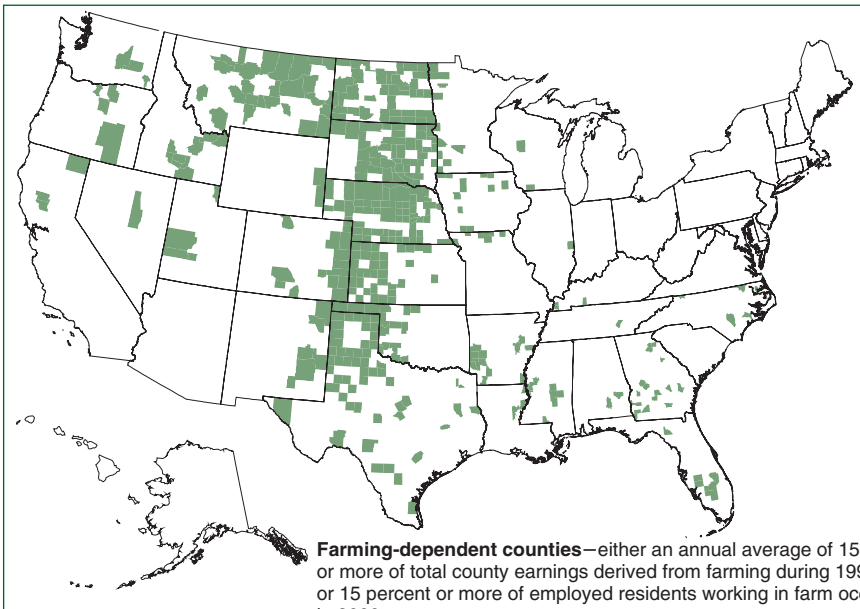
New Economic Engines: Prosperity for many rural communities will depend on innovative income-generating strategies that attract people and jobs. Faced with continuing loss of farm jobs, some rural communities have sought to offset shrinking employment by adding value to farm products. Focusing on the role of farms as a source of raw materials for food and fiber products, these communities seek to add value to agricultural commodities by luring food processing plants to rural areas, developing new consumer or industrial uses for agricultural products, or bypassing conventional wholesale-retail systems to sell food products directly to consumers. These strategies may prove successful for some communities, but ERS research finds that value-added strategies in general are not particularly promising as engines for rural job growth. Food retail and marketing are the largest and fastest growing value-added sectors, but these businesses usually choose to locate in urban areas for more efficient access to consumers, nonagricultural suppliers, and distribution networks. Food manufacturing and other value-added activities account for a relatively small share of rural employment, and the amount of job growth from these value-added strategies has had little impact on the general rural labor market.

Many rural communities are looking at other innovative ways of attracting and retaining high-paying industries and employment to rural areas. The traditional way of attracting firms to a region by offering tax reductions may no longer be sufficient. New approaches, such as providing training and technical assistance by local educational institutions to clusters of similar firms, may be more successful than tax-based incentives because they help firms to adapt innovative production techniques. Training and business assistance programs can help new entrepreneurs in some rural areas enhance their business acumen and improve business communication skills. Networks of small businesses can help build a more effective business infrastructure by coordinating marketing services, warehousing, business resources, and computer technology.

Capitalizing on new uses of the Nation's natural resource base may be essential to ensuring the economic well-being of rural America. This resource base can provide such uses as water filtration, carbon sequestration, and nontraditional energy sources, including methane utilization. Some rural areas may be well suited for the development of renewable energy as well as the production of more traditional fossil-fuel energy. Natural amenities, though, will be the trump card for some rural areas. Rural counties with varied topography, relatively large lakes or coastal areas, warm and sunny winters, and temperate summers have tended to reap huge benefits from tourism and recreation, one of the fastest growing rural industries. Recent ERS research finds that tourism and recreational development in rural areas leads to increases in local employment, income, and wage levels, and improvements in social conditions, such as poverty, education, and health. These strategies have drawbacks, however, particularly in the form of higher housing costs in these nonmetro recreation counties.

Human Resource Development: The wage gap between urban and rural workers reflects a rural workforce with less education and training than urban workers. In 2003, average weekly earnings for nonmetro workers ($555) were about 79 percent of the metro average ($699). In 2000, only 16 percent of rural adults age 25 and older had completed college, half

Nonmetro farming-dependent counties, 1998-2000



Farming-dependent counties—either an annual average of 15 percent or more of total county earnings derived from farming during 1998-2000 or 15 percent or more of employed residents working in farm occupations in 2000.

Prepared by ERS using data from the U.S. Census Bureau.

the percentage of urban adults. Moreover, the rural-urban gap in college completion has widened since 1990. Today, employers are increasingly attracted to rural areas offering concentrations of well-educated and skilled workers. A labor force with low educational levels poses challenges for many rural counties seeking economic development. Rural areas with poorly funded public schools, few good universities and community colleges, very low educational attainment, and high levels of economic distress may find it hard to compete in the new economy. Recent ERS-sponsored research documents the direct link between improved labor force quality and economic development outcomes, finding that increases in the number of adults with some college education resulted in higher per capita income and employment growth rates, although less so in nonmetro than metro counties. Efforts to reduce high school dropout rates, increase high school graduation rates, enhance student preparation for college, and increase college attendance are all critical to improving local labor quality.

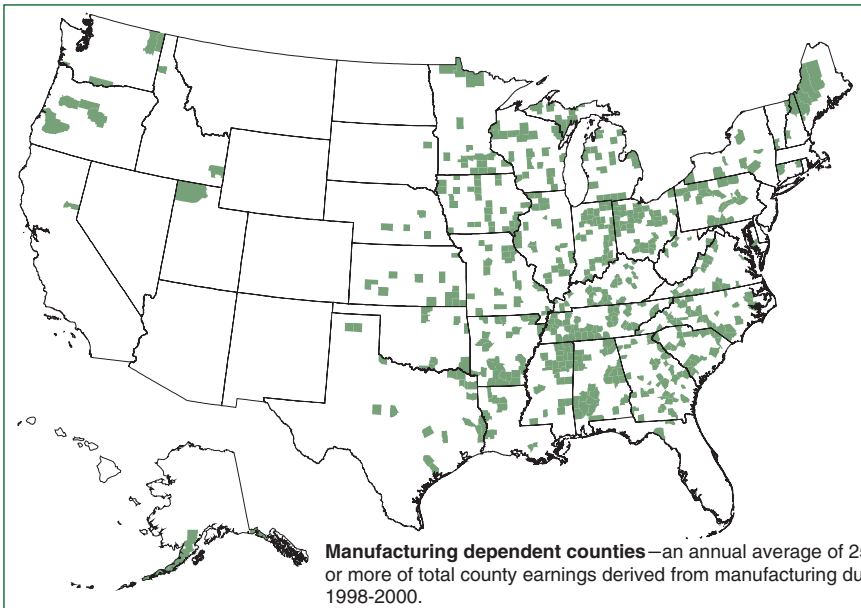
Rural human capital can also be improved by strengthening the quality of classroom instruction. Technical assistance could ensure that best-practice models of distance learning are available to remote schools, where the benefits from such technologies are greatest. Instructional quality could be improved by promoting teacher recruitment and retention efforts in remote and poor rural areas. Efforts to facilitate school-to-work transitions of youth are particularly important in isolated and distressed rural communities. The benefits of these strategies will be greatest in rural communities, where existing workforce development programs (especially the Workforce Investment Act) face special challenges due to high rates of high school dropouts or limited demand for youth labor.

Infrastructure and Public Services: Telecommunications, electricity, water and waste disposal systems, and transportation infrastructures (such as highways and airports) are essential for community well-being and economic development. But many rural communities are financially restrained because of a limited tax base, high costs associated with "dis-economies" of size, and difficulties adjusting to population growth or decline. Investments in needed infrastructure have increased in recent years, but high costs and deregulation pose challenges.

Investment in rural infrastructure not only enhances the well-being of community residents, but also facilitates the expansion of existing businesses and the development of new ones. Recent ERS research assessed the economic impacts of 87 water and sewer projects funded by the Economic Development Administration and found that these projects in general created or saved jobs, spurred private-sector investment, attracted government funds, and enlarged the property tax base. But the average urban water/sewer facility, which costs only about one-third more than the average rural facility, generated two to three times the economic impacts of rural facilities. The rural-urban difference in economic benefits likely stems from the generally more abundant infrastructure of urban areas—easy access to highways, railroads, and airports, primary and secondary suppliers, input and output markets, community facilities and amenities, and skilled labor.

The Federal Government has helped rural communities finance public infrastructure, but many communities still lack infrastructure like advanced telecommunications and air transportation services. Information and communication technology—abetted by financial and technical assistance—can help smaller communities enjoy the same benefits as cities, such as higher standards of health care and virtually unlimited educational opportunities. Federal financial assistance for deploying broadband access and incentives for State, private, and public partner-

Nonmetro manufacturing-dependent counties, 1998-2000



Manufacturing dependent counties—an annual average of 25 percent or more of total county earnings derived from manufacturing during 1998-2000.

Prepared by ERS using data from the U.S. Census Bureau.

Rural counties with lakes, mountains, and good climates attract businesses related to tourism and recreation.

ships to develop fiber optic or wireless capabilities are among the options for rural areas seeking to invest in a telecommunication infrastructure.

Because many rural problems occur regionwide, some policies need to address broader geographic implications. Agriculture, as a major source of income and employment, is concentrated in the northern Great Plains and western Corn Belt. Rural manufacturing is disproportionately located in the Midwest and Southeast. Mining and other extractive activities are conducted west of the Mississippi River and in Appalachia. All of these industries have experienced very slow job growth or job loss in recent decades. Regional or multicommunity cooperative efforts, such as the Delta Regional Authority and the Northern Great Plains Regional Authority, may offer rural areas a better chance of success in responding to industrywide declines or problems associated with persistent poverty, population loss, or educational disadvantage. Job generation and human resource development will require close coordination to ensure that the skills possessed by workers will be appropriate for the new, largely service-based and information-dependent industries, and that the jobs will be available in the regional economy.

Unfortunately, little empirical analysis is available on what strategies will be most effective in which areas under what circumstances. There is no one formula for success. Policy analysts will do well to look to the areas that have achieved prosperity to help develop successful prototypes for areas that may be unprepared to meet the challenges of the future.

This article is drawn from . . .

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Understanding Economic and Behavioral Influences on Fruit and Vegetable Choices

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ECONOMIC RESEARCH SERVICE/USDA

Encouraging Americans to eat more fruits and vegetables has been a central theme of Federal dietary guidance for more than a decade. A recent Food Marketing Institute survey found that almost 70 percent of American shoppers believe their diets would be healthier if they ate more fruits and vegetables. At the same time, the growth of international trade has enabled supermarkets to keep their aisles stocked with a wide range of fresh produce on a year-round basis. In addition, a bounty of time-saving products, such as bagged, pre-washed spinach and salads or "snack-pack" baby carrots and celery sticks, now provide consumers with convenient preparations and takeout options. Still, despite conditions that would appear to favor higher U.S. consumption of fruits and vegetables, Americans are eating far fewer servings than recommended.

USDA food supply data indicate that Americans consume 1.4 servings of fruit daily, less than half the 4 servings or 2 cups recommended in the 2005 *Dietary Guidelines* for adults eating 2,000 calories per day. Vegetable consumption is higher, at 3.7 servings per day, but is still below the recommended 5 servings or 2½ cups per day. In addition, even when U.S. consumers heed the advice to eat their vegetables, their choices do not match dietary recommendations. Consumption of dark-green and orange vegetables, two categories emphasized by dietary experts for their nutritional value, is less than half of recommended amounts.

Fruits and vegetables are vigorously promoted because they offer a wide array of health benefits. They are leading sources of several essential nutrients, such as vitamins A and C and folate. In addition, diets rich in fruits and vegetables are associated with a decreased risk of several chronic diseases, including cardiovascular disease, type 2 diabetes, and some cancers.

Most fruits and vegetables are also naturally low in calories, although their value in weight-control efforts may depend on how these foods are prepared. Using national food consumption data collected by USDA in 1994-96, researchers found eating more fruit to be associated with a lower body mass index (BMI), a measure used by health experts to assess body weight in relationship to height. For example, both obese women and overweight school-age girls ate 1.3 servings of fruit per day, significantly lower than the 1.5 daily servings consumed by healthy weight women and girls. Higher vegetable intake, however, was not consistently related to healthy weight status. The researchers speculate that many people are not eating vegetables in their natural low-fat, low-calorie form, as they would eat fruit. In fact, the most popular vegetable choice of most Americans is fried potatoes.

Marketers and nutritionists alike have puzzled over the reasons for Americans' fruit and vegetable shortfalls. Are fruits and vegetables too expensive? Are they incompatible with personal and household tastes or the modern trend to more eating out? Do their nutrition benefits matter to knowledgeable consumers? To shed light on the persistent difficulty in increasing U.S. produce consumption, ERS

U.S. fruit and vegetable consumption falls short of recommendations

Groups	2003 food supply[1]	Recommended[2]
	Servings per capita per day	*Servings per capita per day*
Total vegetable	3.7	5.0
Dark-green[3]	0.2	0.9 (6 servings/week)
Orange (carrots, sweet potatoes, and others)	0.2	0.6 (4 servings/week)
Legumes	0.2	0.9 (6 servings/week)
Potatoes, corn, peas, and other starchy vegetables	1.3	0.9 (6 servings/week)
Tomatoes and others[4]	1.8	1.9 (13 servings per week)
Total fruit	1.4	4.0
Citrus, melon, berries	0.5	* No subgroup recommendation
Other fruit	0.9	* No subgroup recommendation

[1]ERS estimates annual amounts of food available for human consumption in the United States. These figures exclude inedible portions and are adjusted for spoilage and waste.
[2]Based on USDA proposed daily food intake patterns at intake level of 2,000 calories per day. Accessed at: www.usda.gov/cnpp/pyramid-update/FGP%20docs/TABLE%201.pdf on November 15, 2004.
[3]Includes broccoli, spinach, romaine, escarole, and leaf lettuce.
[4]Other vegetables include iceberg lettuce, onions, cabbage, bell peppers, celery, and cucumbers.

researchers have examined how economic, social, and behavioral factors influence consumers' fruit and vegetable choices.

Cost Is Not the Only Factor

The cost of fruits and vegetables is a commonly cited reason why consumers don't eat more of these healthy foods. This is somewhat surprising, since rising incomes and low food prices mean that Americans now spend less of their income on food than ever before—10.1 percent of disposable personal income in 2002 versus 20.5 percent in 1950. ERS researchers using 1999 at-home food purchase data found numerous options among both fresh and processed fruits and vegetables whereby consumers could meet Food Guide Pyramid recommendations for less than $1 per day.

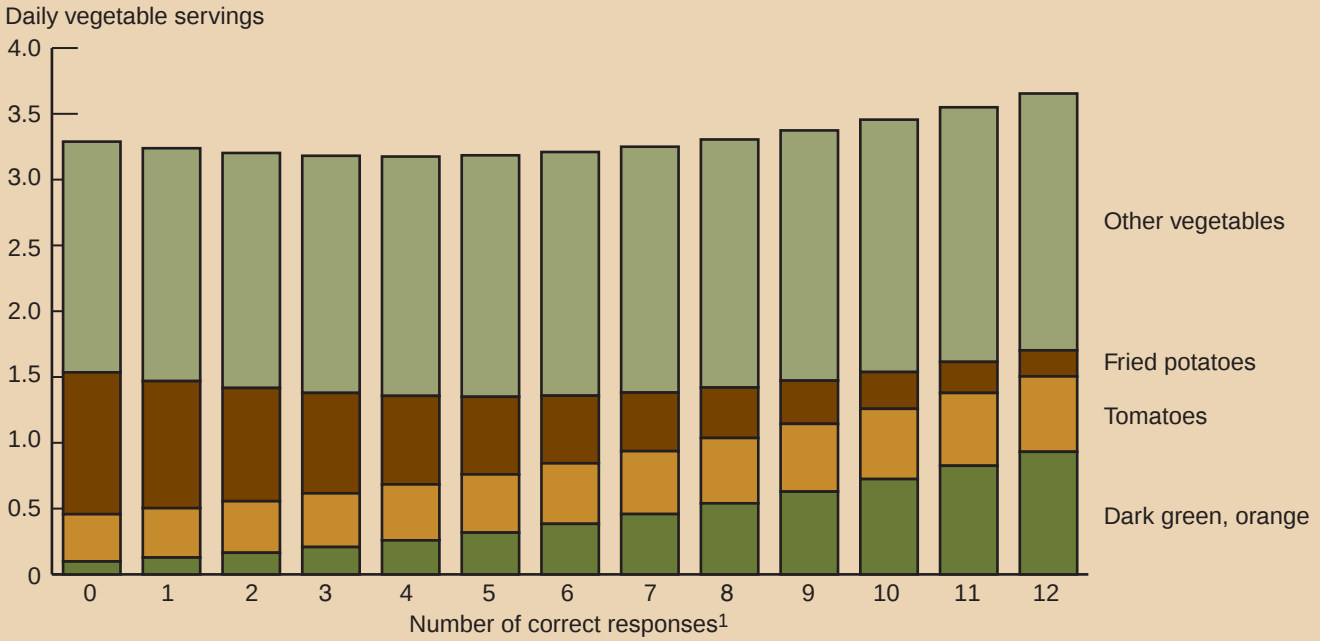
Nevertheless, income-constrained consumers may not make purchasing fruits and vegetables a high priority. Other ERS researchers examining the at-home fruit and vegetable purchases by households over a 2-week period in 2000 found that low-income households spent $3.59 per person per week on fruits and vegetables. Nineteen percent of poor households purchased no fruits and vegetables at all. By contrast, higher income households spent $5.02 per person per week on produce, with only about 9 percent of households buying no fruits and vegetables. Moreover, small increases in income were likely to induce greater fruit and vegetable spending among higher income households, but had no impact on spending by low-income households. Among all income levels, education had a much greater impact on household produce purchases than did income. Controlling for income, college-educated households had the highest level of per capita fruit and vegetable expenditures ($5.99 per person per week versus $4.25 for households headed by a high-school-only graduate).

A person's knowledge of nutrition also influences his or her choice of what foods go on the plate. Using data from the 1994-96 Continuing Survey of Food Intakes by Individuals and its companion Diet and Health Knowledge Survey, ERS researchers found that consumers with more nutrition knowledge not only ate more vegetables, they also chose a more healthful mix of vegetables than other consumers. These findings provide evidence of the value of nutrition knowledge, but other personal and lifestyle characteristics help determine food choice, and their influences may enhance or negate the effectiveness of information.

Household Composition, Cultural Background Also Play a Role

Federal dietary guidance emphasizes that consumers should choose a varied mix of vegetables to get a wide range of essential nutrients. In particular, USDA

Consumers with more dietary knowledge eat a more nutritious mix of vegetables



[1]Number of correct answers supplied by the household head to 12 questions from the Diet and Health Knowledge Survey. Topics included knowledge of recommended servings for the Food Guide Pyramid food groups and awareness of the association of diet with specific health problems.

has urged Americans to increase their consumption of nutrient-rich deep-green and orange vegetables, such as broccoli, spinach, carrots, and winter squash. Examining 1999 at-home food purchase data, ERS researchers hypothesized that the number of different types of vegetables purchased over a year would vary by household composition, with larger households purchasing a more varied mix. Larger households are thought to cook more meals from scratch, with vegetables commonly used in preparing such meals. Up to a point, this turned out to be true. Households with four members bought 16 of 24 different popular vegetable types, compared with just 10 types for single-person households. But when household size reached five or more members, variety in vegetable purchases began to decline, with households of six members buying 14 types of vegetables. A possible explanation may be that in larger households, it can be difficult to prepare meals that please all members. Meal planners in such households may tend to compromise by repeatedly choosing the subset of vegetables that everyone likes.

The kinds of individuals in a household also influence food purchases. More educated households bought a slightly more varied mix of vegetables. By contrast, the presence of children exerted a negative influence on the variety of purchases—reducing the number of different vegetables bought by one. This effect demonstrates the veto power children can have over vegetables they dislike.

In addition, a household's ethnic background plays a role. Traditional Asian and Hispanic foods incorporate a wider variety of vegetables than some other cuisines. All else equal, Asian households tend to buy one to two more types of vegetables, and Hispanic households about one more, than White, non-Hispanic households.

More Eating Out = Less Fruit and Vegetables

The most important food-related lifestyle change of the past two decades is probably the increase in consumption of food prepared away from home, whether eaten in restaurants, as takeout, or as home-delivered meals. Data from USDA's Continuing Survey of Food Intakes by Individuals, collected in 1994-96 and 1998, indicate that Americans consume about a third of calories from food prepared away from home, up from less than a fifth in 1977-78.

But when Americans order their restaurant or takeout meals, fruits and most vegetables seldom make the list. Away-from-home food accounts for less than half a serving of fruit, and one and a quarter servings of vegetables. Moreover, vegetable choices while dining out are less likely to match USDA guidance—fried potatoes make up approximately 35 percent of vegetables eaten away from home, compared with 10 percent of at-home vegetable consumption.

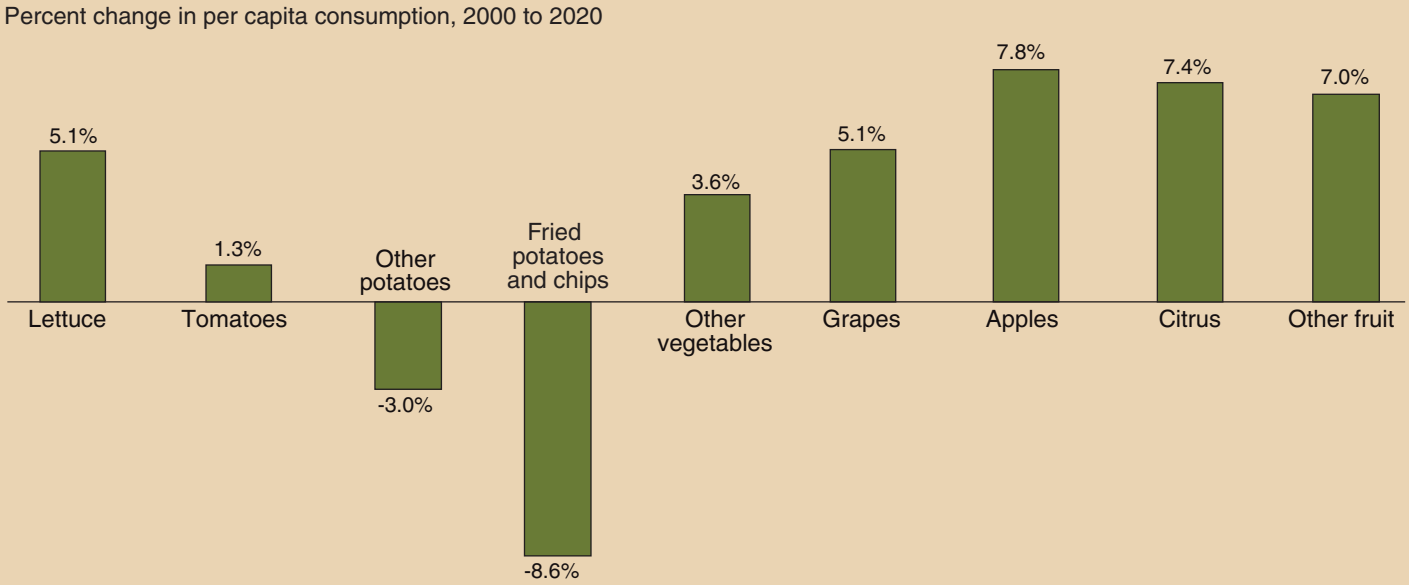
Rubberball

When eating away from home, fried potatoes are often the vegetable of choice.

Hayden Stewart, USDA/ERS

Asian-Americans buy a wider variety of vegetables.

In 2020, the convergence of several demographic trends favors Americans' eating more fruit and less potatoes



Factors Predicting Change in Fruit and Vegetable Consumption

Looking ahead to 2020, demographic and socioeconomic factors are expected to influence fruit and vegetable consumption. The aging of the U.S. population will likely favor fruit consumption and consumption of most vegetables except fried potatoes. Rising incomes and education levels should produce similar trends. The increase in the Hispanic population is expected to favor consumption of tomatoes, which feature prominently in Hispanic dishes. These trends are projected to increase per capita fruit consumption between 5 and 8 percent, and increase per capita consumption of most vegetables. Potatoes are the major exception, with per capita intake of fries and chips projected to drop by almost 9 percent; other forms of potatoes may drop by 3 percent.

The influence of income on projected demand for fruits and vegetables is complex. People with higher incomes generally have more years of schooling and greater nutrition knowledge, but they also tend to eat out more frequently. These factors have powerful but contradictory effects. Equipped with higher education and greater nutrition knowledge, consumers choose more fruits and vegetables, except fried potatoes and chips. But, when eating out, choices often include less fruit, and more potatoes and lettuce.

Opportunities and Challenges for Promoting Produce

These findings should give nutritionists, marketers, and others seeking to promote fruit and vegetable consumption a sense of both opportunities and challenges. Overall, the findings indicate that information does matter—better educated consumers with more nutrition knowledge consume more fruits and vegetables and make more nutritious choices within the category. This should be encouraging to campaigns that focus on increasing consumer awareness of the health benefits of these foods.

Information is not, however, the only factor guiding consumer choice, and promotional advice that provides flexible

Some fast food chains are promoting new fruit and vegetable options to their younger customers.

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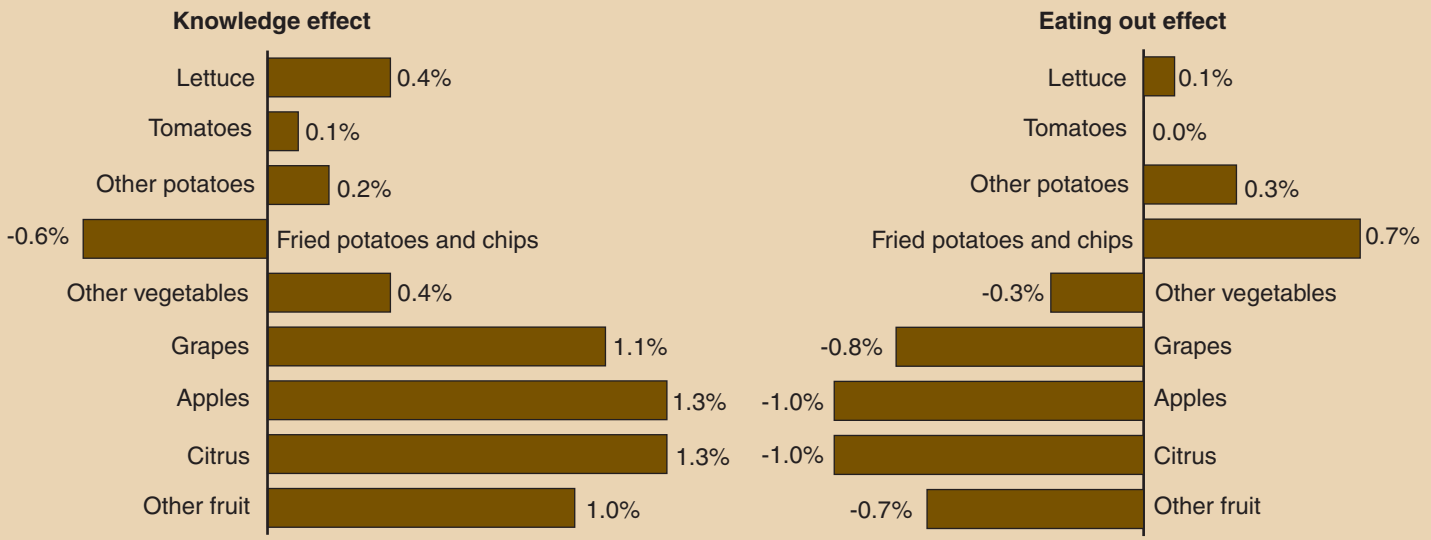
Rising knowledge of nutrition and health encourages consumption of fruits and most vegetables, while eating out favors consumption of lettuce and potatoes, but not fruit

Percent change in per capita consumption, 2000 to 2020



strategies for accommodating a range of preferences and lifestyles may be more effective than nutrition information alone. Householders with large families or picky children may benefit from practical advice on how to accommodate the varied preferences of household members. Promotional efforts also need to consider cultural preferences. For fruit and vegetable promotions to be effective in a diverse society, it is important to examine how variety can be promoted within the context of specific cultures and cuisines.

The trend to eat more and more meals outside the home is probably the biggest challenge to those seeking to promote fruit and vegetable consumption, given the very small amounts of fruit and most vegetables consumed away from home. While increasing nutrition knowledge is expected to raise fruit and vegetable consumption, increased eating away from home could negate these gains. Recently, restaurants and fast food establishments have expanded their menus to include more healthful options, such as salads and fresh-cut fruit.

As these ERS research findings demonstrate, many behavioral and economic factors influence the consumer's decision to eat fruits and vegetables. Understanding these factors will help the food industry develop and market fruit and vegetable products that offer consumers convenience, flexibility, and options when eating out. But in the end, consumer preference drives the marketplace. If educational and promotional strategies succeed in getting consumers to reach for fruits and vegetables more often, the market will respond, making it ever-easier for consumers to eat the varied, abundant mix of fruits and vegetables experts recommend.

This article is drawn from . . .

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Data may have been updated since publication. For the most current information, see www.ers.usda.gov/publications/agoutlook/aotables/.

Farm, Rural, and Natural Resources Indicators

	1990	2000	2001	2002	2003	2004	Annual percent change 1990-2000	2002-03	2003-04
Cash receipts ($ billion)	169.5	192.1	200.1	195.1	211.6	235.4 f	1.3	8.5	11.2
Crops	80.3	92.5	93.4	101.3	106.2	113.2 f	1.4	4.8	6.6
Livestock	89.2	99.6	106.7	93.8	105.5	122.2 f	1.1	12.5	15.8
Direct government payments ($ billion)	9.3	22.9	20.7	11.0	15.9	14.5 f	9.4	44.5	-8.8
Gross cash income ($ billion)	186.9	228.7	235.6	222.0	243.9	266.1 f	2.0	9.9	9.1
Net cash income ($ billion)	52.7	56.7	59.5	50.7	68.6	77.8 f	0.7	35.3	13.4
Net value added ($ billion)	80.8	91.9	94.1	78.8	101.4	118.0 f	1.3	28.7	16.4
Farm equity ($ billion)	702.6	1,025.6	1,070.2	1,110.7	1,180.8	1,247.0 f	3.9	6.3	5.6
Farm debt-asset ratio	16.4	14.8	14.8	14.8	14.4	14.2 f	-1.0	-2.7	-1.4
Farm household income ($/farm household)	38,237	61,947	64,117	65,757	68,506	71,102 f	4.9	4.2	3.8
Farm household income relative to average U.S. household income (%)	103.1	108.6	110.2	113.7	na	na	0.5	na	na
Nonmetro-Metro difference in poverty rate (%)	3.6	2.6	3.1	2.6	2.1	na	-3.2	-19.2	na
Cropland harvested (million acres)	310	314	311	307	314 p	na	0.1	2.3	na
USDA conservation program expenditures ($ bil.)[1]	3.0	3.4	3.7	3.5 q	na	na	1.3	na	na

Food and Fiber Sector Indicators

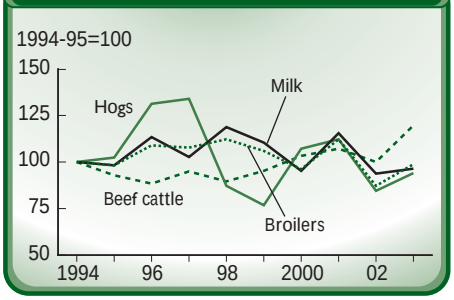
U.S. gross domestic product ($ billion current)[2]	5,803	9,825	10,082	10,446	10,863 f	na	5.4	4.0	na
Food and fiber share (%)	15.1	12.6	12.3	na	na	na	-1.8	na	na
Farm sector share (%)	1.4	0.8	0.8	0.8	na	na	-5.4	na	na
Total agricultural imports ($ billion)[1]	22.7	38.9	39.0	41.0	45.7	52.7	5.5	11.5	15.3
Total agricultural exports ($ billion)[1]	40.3	50.7	52.7	53.3	56.2	62.3	2.3	5.4	10.9
Export share of the volume of U.S. agricultural production (%)	18.2	17.6	17.7	16.5	17.9	na	-0.3	8.5	na
CPI for food (1982-84=100)	132.4	167.9	173.1	176.2	180.0	186.2	2.4	2.2	3.4
Share of U.S. disposable income spent on food (%)	11.2	10.1	10.2	10.1	10.1	na	-1.0	0.0	na
Share of total food expenditures for at-home consumption (%)	55.4	53.3	53.9	53.8	53.1	na	-0.4	-1.3	na
Farm-to-retail price spread (1982-84=100)	144.5	210.3	215.4	221.2	na	na	3.8	na	na
Total USDA food and nutrition assistance spending ($ billion)[1]	24.9	32.6	34.2	38.0	41.8	46.1	2.7	10.0	10.3

f = Forecast. p = Preliminary. q = 2002 Administration request. na = Not available.

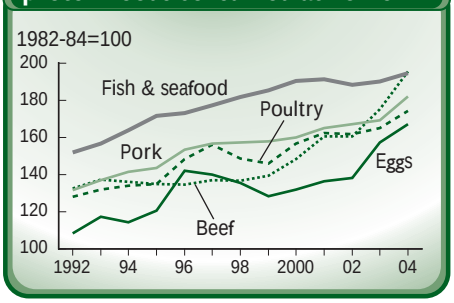
[1] Based on October-September fiscal years ending with year indicated.

[2] Forecast for 2003 based on the Office of Management and Budget's Midsession Budget Review, July 2003.

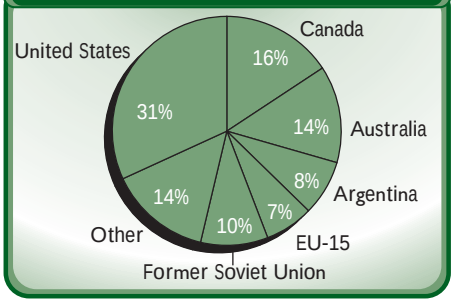
Indices of annual prices received by farmers: Livestock and milk



Consumer price indices for high-protein foods consumed at home



Major wheat-exporting countries, 2003/04



For more information, see www.ers.usda.gov/amberwaves/

Behind the Data

Natural Amenities Scale

Nature is rural America's greatest resource. At one time, its primary use was for food, timber, and minerals. But the enjoyment by vacationers, young families, and retirees is now its major use in many areas. Forest Service surveys show that over half of the U.S. population age 16 and older spends time outdoors viewing natural scenery in any given year.

Just as not all land is equally good for farming, not all nature is equally attractive to visit or inhabit. While researchers have developed several measures of the suitability of land for farming, they are only beginning to develop similar measures of the relative attractiveness of different outdoor settings.

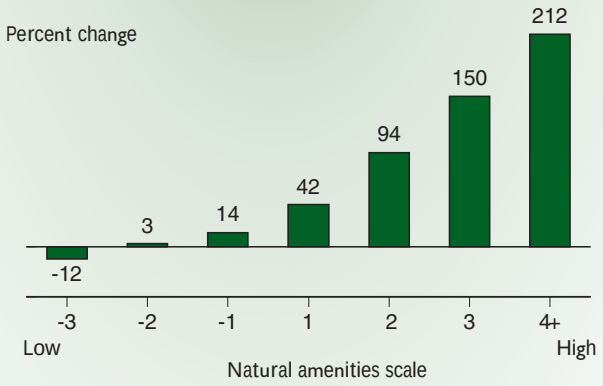
ERS created a very basic scale of natural amenities, including climate, topography, and water (lakes, ponds, oceans)—all relatively enduring characteristics. The scale includes four measures of climate: average number of days of sun in January, average January temperature, lowness of average July humidity, and temperateness of July weather. Temperateness is measured in such a way that places with the warmest winters and coolest summers score highest on the scale.

The topography measure was taken from a 1937 *National Geographic* map, which had 26 categories ranging from flat with no hills to highly mountainous. The water measure is based on the proportion of county area classified as water by the Bureau of the Census. Because county boundaries extend offshore, ocean front as well as lakes and ponds are reflected in this measure. The measure used in the scale is a relative (logarithmic) measure. (For example, if County B has twice as much water area per square mile as County A, the difference in scores is the same whether County A is 5 percent water or 25 percent water.)

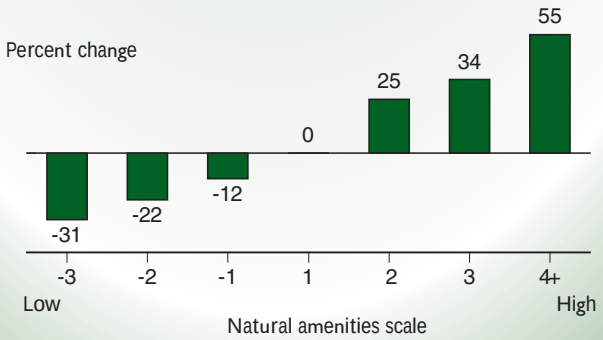
These six characteristics do not tend to be found together; often there are tradeoffs. For instance, areas with more extensive surface water tend to have more temperate climates than their neighbors, but they also tend to have cloudier Januarys and more humid Julys. The natural amenities scale is designed to reflect these tradeoffs by combining these characteristics into a single scale. Statistical analyses of county population data from 1970 to 1996 indicate that the scale accurately reflects the overall relationships between these characteristics and population change during that period. These analyses and the methods used to create the scale are described in an ERS report, *Natural Amenities Drive Rural Population Change* (AER-781).

The scale highlights the association between natural amenities and population change over the past 30 years. Counties at the high end more than tripled their population on average over the past 32 years, while counties at the low end lost population. However, the scale is useful in other ways as well. For instance, while the number of farms in the U.S. has declined dramatically over time, the number has actually risen in high-amenity counties. There are a number of possible reasons for this. For instance, counties with low scores tend to be relatively flat and extensively farmed, making farm consolidation relatively easy. At the same time, given that people are drawn to natural amenities, it is possible that there are far more prospective farmers—even among sons and daughters—in places where landscape is varied, climate is pleasant, and population and employment are growing.

Natural amenities and average rural county population change, 1970-2003



Natural amenities and average rural county change in number of farms, 1977-2002



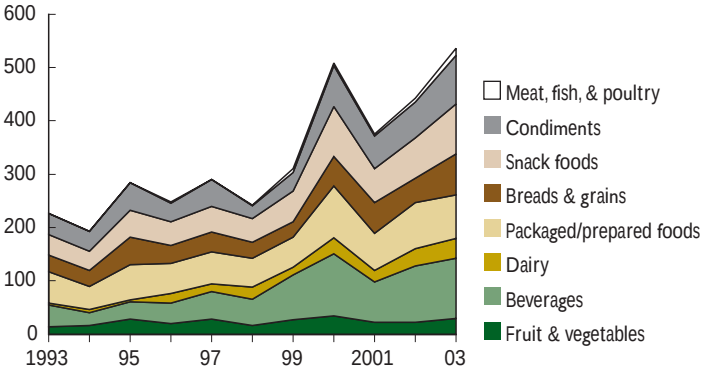
David A. McGranahan, dmcg@ers.usda.gov

This article is drawn from . . .

Natural Amenities Drive Rural Population Change, by David A. McGranahan, AER-781, USDA/ERS, October 1999, available at: www.ers.usda.gov/publications/aer781/

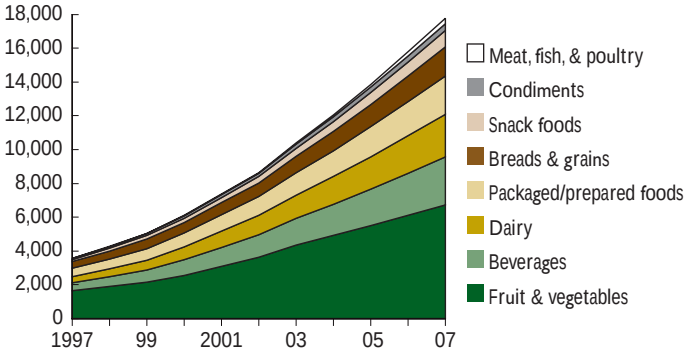
Market and Trade

New organic product introductions are led by beverages, prepared foods, and snacks



Source: ERS calculations using ProductScan data from Datamonitor, 2004.

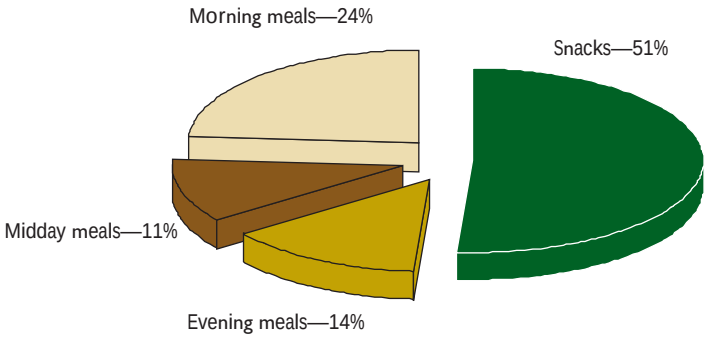
Fruits and vegetables remain the largest category of sales, accounting for 42 percent of organic food sales in 2003



2004-2007 estimated.
Source: *Nutrition Business Journal*, 2004.

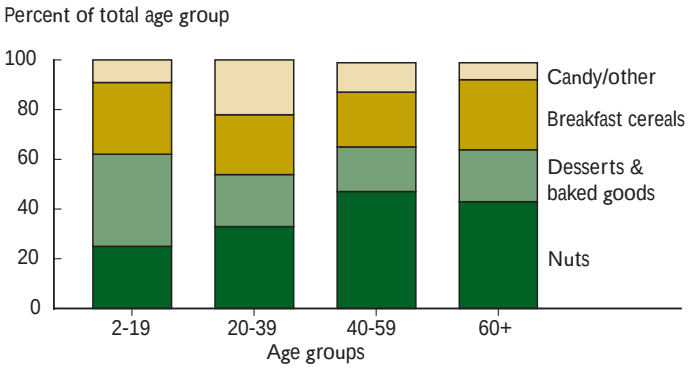
Diet and Health

Over half of tree nuts are eaten as snacks



Source: ERS analysis of USDA's 1994-96 Continuing Survey of Food Intakes by Individuals, 2-day.

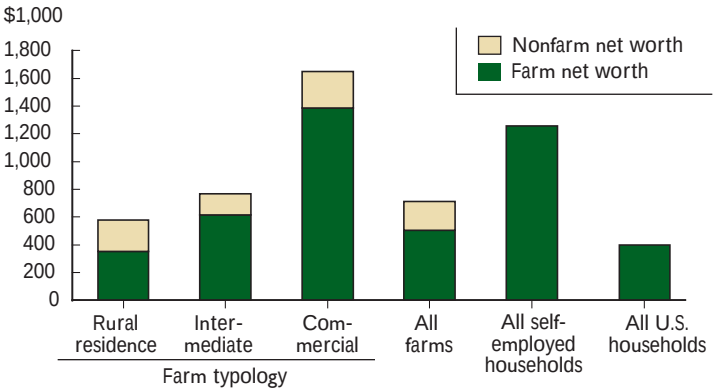
Adults favor eating tree nuts as nuts; children like desserts and baked goods with nuts



Source: ERS analysis of USDA's 1994-96 Continuing Survey of Food Intakes by Individuals, 2-day.

Farms, Firms, and Households

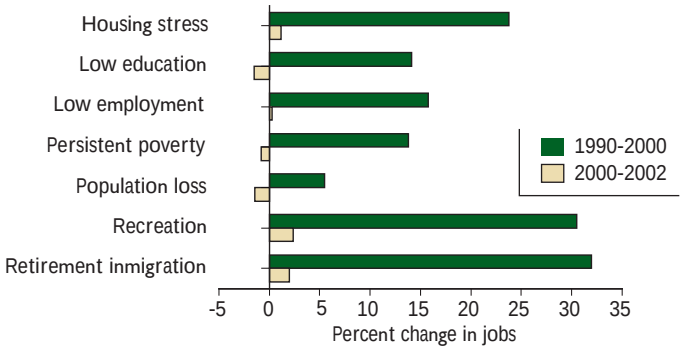
Commercial farm households have higher wealth compared with all other households



Sources: USDA's 2003 Agricultural Resource Management Survey and 2001 Survey of Consumer Finances.

Rural America

In the 1990s, jobs increased faster in rural counties with retirement inmigration, recreation, and housing stress



Note: For definitions of county types, see the ERS county typology at www.ers.usda.gov/briefing/rurality/typology/. County groups are not mutually exclusive, a county may be classified under more than one type.

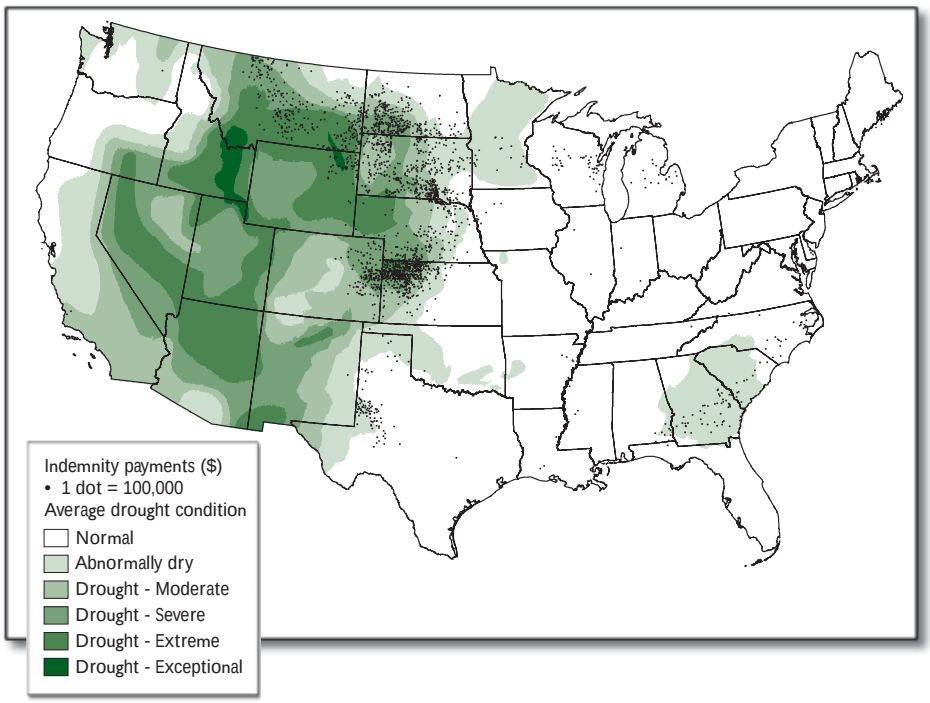
On the Map

Drought triggers crop insurance indemnity payments... in some areas

Much of the western U.S. experienced severe, extreme, or exceptional drought in 2004. As of January 17, 2005, USDA had paid producers $260 million in crop insurance indemnities related to the 2004 summer drought plus an additional $200 million to winter wheat growers. Areas experiencing drought conditions and those receiving indemnity payments do not always overlap—drought impacts and indemnity payments depend not only on the physical extent and severity of drought, but also on economic factors, such as location, investment in irrigation, and producers' choices about participation in crop insurance and other programs. Possible explanations for drought-driven crop insurance payments outside identified drought areas include localized drought conditions or inadequate moisture at critical crop development times in areas with otherwise adequate precipitation.

Noel Gollehon, gollehon@ers.usda.gov
Shawn Bucholtz, sbucholtz@ers.usda.gov

Warm-season drought areas and drought-based crop insurance payments, 2004



Source: April to September drought severity index from the Drought Monitor (www.drought.unl.edu/dm/index.html) and data from USDA's Risk Management Agency (www.rma.usda.gov/ftp/miscellaneous_files/cause_of_loss/prem_and_indem/). Excludes indemnity payment data for wheat in States where mostly winter wheat is grown.

In the Long Run

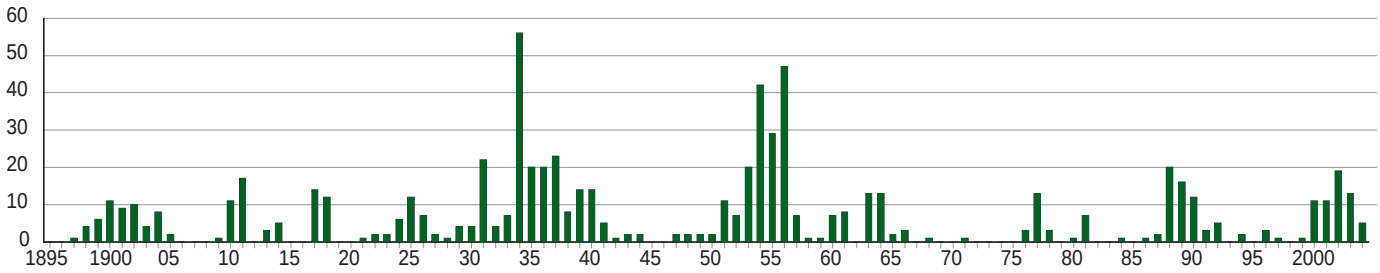
Drought is a recurring risk faced by agricultural producers

Over the past century, an average of 7 percent of U.S. agricultural land has experienced severe or extreme drought each year. Over half the total agricultural land experienced severe or extreme drought in 1934, and over 40 percent in 1954 and 1956. More recently, in 1988 and 2002, about 20 percent of acreage was affected. In 2004, about 5 percent of the agricultural land experienced severe, extreme, or exceptional drought.

Noel Gollehon, gollehon@ers.usda.gov
Shawn Bucholtz, sbucholtz@ers.usda.gov

Severe and extreme drought on agricultural land, 1895-2004

Percent of acres with severe or worse drought



Note: Percentage of land is based on current land use for agriculture, including land in crops, pasture, range, and USDA's Conservation Reserve Program.
Source: National Oceanic and Atmospheric Administration.

Current Activities

Conservation Reserve Program Signup Options Considered

In 2007-08, contracts covering about half the acres enrolled in USDA's Conservation Reserve Program will expire, requiring several new signups. ERS economist Daniel Hellerstein participated in an interagency team that examined various signup alternatives in terms of cost, administrative burden, and possible environmental consequences. Their goal was to provide information to policymakers who will choose among signup options. **Daniel Hellerstein, danielh@ers.usda.gov**

State Fact Sheets Updated

The U.S. State Fact Sheets are one of the most popular items on the ERS website (www.ers.usda.gov/statefacts/), with over 20,000 unique users each month. They contain the most current data in an easy-to-read style on population, per capita income, earnings per job, poverty rate, total number of jobs, unemployment rate, percentage employment change, farm and farm-related jobs, top export commodities, farm characteristics, and farm financial indicators for each State and the United States. Recent updates include the addition of several types of data—2002 Census of Agriculture data on State farm characteristics, 2002 rural and urban poverty rates, and 2003 farm financial information—as well as new features, such as downloadable spreadsheets and frequently asked questions. Future enhancements will include graphical interfaces to develop charts and maps. **Timothy Parker, tparker@ers.usda.gov**

Examining Southeast Asia's Dynamic Agricultural Markets

ERS is undertaking several activities to better understand the food, agriculture, and policy developments in Southeast Asia, which is both a growing market and a significant competitor for U.S. agriculture. The region, with over 500 million people, is one of the most dynamic parts of the world trade in agriculture. Rapid economic growth has led to changing diets in much of the region, fueling growing imports of feedstuffs, wheat, and processed products. Large investments in agriculture and food processing, continuing for decades, have also made Southeast Asia a major food-exporting region. ERS, with funding from the Emerging Markets Program of USDA's Foreign Agricultural Service, is beginning collaborative work with agriculture ministries and institutes in the Philippines and Vietnam. This work includes studies of trade patterns and the broiler sector, as well as a conference session on changes in the structure of the region's food retailing. **John Dyck, jdyck@ers.usda.gov**

Program of Research on the Economics of Invasive Species Management

ERS is seeking proposals for the 2005 Program of Research on the Economics of Invasive Species Management (PREISM) competitive award program (www.ers.usda.gov/briefing/invasivespecies/). Proposals should focus on applied economic research and/or decision support system development for USDA policies and programs related to invasive species. Priority research areas include: (1) Institutions and Incentives for Efficient Invasive Species Prevention and Management, (2) Practical Decision Analysis for Invasive Species Management, and (3) International Dimensions of Invasive Species Management. Anticipated funding is approximately $1 million. Proposals are due April 29, 2005. **Craig Osteen, costeen@ers.usda.gov,** and **Donna Roberts, droberts@ers.usda.gov**

New Releases

Family Farms Come in All Sizes

U.S. farms range in size from very small retirement and residential/lifestyle farms to establishments with sales in the millions of dollars. The organization of farming affects the efficiency and competitiveness of the farm sector, the well-being of farm households, the design and impact of public policies, and the nature of rural areas. *Structural and Financial Characteristics of U.S. Farms: 2004 Family Farm Report* (AIB-797) explores trends in the organization of farming, based primarily on 2001 data from the Agricultural Resource Management Survey, its predecessor (the Farm Costs and Returns Survey), and the census of agriculture. The *2005 Family Farm Report,* which will feature 2003 data, will be released later this year. **David Banker, dbanker@ers.usda.gov**

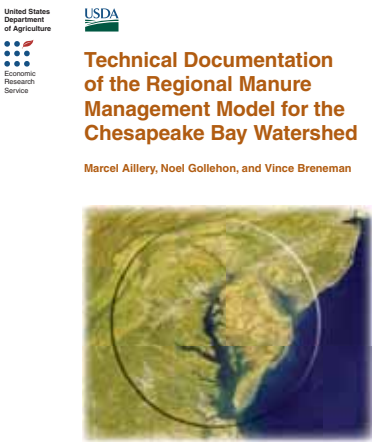
Trade and Rural Areas

Given that American farmers produce raw farm products well in excess of domestic demand and that processing these excess products could yield additional income and jobs, rural planners have viewed the food export market as a potential base for rural development. Despite its logical appeal, it has been difficult to demonstrate the strength of this potential development effect for rural areas. A recent study by Gerald Schluter and Chinkook Lee (formerly of ERS) of the growth in U.S. meat exports in the last two decades suggests reasons for this difficulty. In "Is There a Link Between the Changing Skills of Labor Used in U.S.

Processed Food Trade and Rural Employment?" (*Journal of Agricultural and Applied Economics* 36(3):691-703, December 2004), the researchers show that, while the U.S. has long had an apparent comparative advantage in meat production, the growth in meat exports resulted from a combination of changes that affected the cost of production and the demand for meat, as well as changes resulting from public policy. Most, if not all, of these changes were outside the control of rural development policymakers. **Gerald Schluter, schluter@ers.usda.gov**

Chesapeake Bay Regional Model Documented

The production and disposal of animal manure in the Chesapeake Bay watershed—an environmentally sensitive area with large concentrations of confined animals—is evaluated using a regional modeling framework. *Technical Documentation of the Chesapeake Bay Regional Model* (TB-1913) presents an overview of the modeling system, which is used to evaluate the feasibility of land application of manure as a regional manure management strategy and the effect of key policy provisions and manure use assumptions on costs to the animal sector. Results from an initial application of the model are featured in the ERS report *Manure Management for Water Quality: Costs to Animal Feeding Operations of Applying Manure Nutrients to Land* (AER-824). **Marcel Aillery, maillery@ers.usda.gov,** and **Noel Gollehon, gollehon@ers.usda.gov**



Competitiveness of Food Manufacturers and Retailers

In "Change and Firm Valuation in U.S. Food Retailing and Manufacturing" (*Journal of Food Distribution Research* 35(2):14-25, July 2004), Bruce Bjornson (formerly University of Missouri), and Phil Kaufman examine whether profitability of large food manufacturing firms and large retail firms has shifted in recent years due to industry consolidation, expanding use of scanner data, and entry by nontraditional retailers. They also used current firm valuations to predict future change in firm profitability as a result of these developments. While returns on investment of large food retailers have been expected to increase relative to those of large packaged food manufacturers, the researchers found that this has not yet happened and that market valuations imply that retailers are not likely to gain on manufacturers in the future. **Phil Kaufman, pkaufman@ers.usda.gov**

Education and Rural Communities

The No Child Left Behind Act of 2002 created a new era of increased school accountability to ensure that our public schools adequately prepare their students for the increasingly high-skill "new economy" in which we now live. In response to particular concern about the effects of these reforms in rural areas, ERS cosponsored a 2003 national conference on rural education with the Southern Rural Development Center and the Rural School and Community Trust. The key findings from the conference are presented in *The Role of Education: Promoting the Economic and Social Vitality of Rural America* and offer insight into the important and often fragile relationship between rural schools and communities in America. **Robert Gibbs, rgibbs@ers.usda.gov**

Aggregate Food Expenditures

Unlike data on physical quantities of food, food expenditure data contain information relevant to consumer choice among broadly defined food aggregates. In

"The Generalized Composite Commodity Theorem and Food Demand Estimation" (*American Journal of Agricultural Economics* 87(1):28-37, February 2005), ERS researchers have provided evidence that data on consumer food expenditures rather than data on physical units of food consumption is properly aggregated to provide accurate composite measures of food demand. **Al Reed, jareed@ers.usda.gov**

Commodity Markets and Trade

ERS Outlook reports provide timely analysis of major commodity markets and trade, including special reports on hot topics. All reports are available electronically and can be found at www.ers.usda.gov/publications/outlook/ along with a calendar of future releases. **Joy Harwood, jharwood@ers.usda.gov**

The citations here and in the rest of this edition are just a sample of the latest releases from ERS. For a complete list of all new ERS releases, view the calendar on the ERS website: www.ers.usda.gov/calendar/

Kathy Augustine

As Acting Chief of the Information Technology (IT) Services Branch in ERS's Information Services Division, Kathy Augustine wears many hats, serving as the manager of the agency's IT infrastructure, as well as performing network administration tasks and responding to Help Desk requests from ERS employees. Her focus on technology improvements has allowed the agency to upgrade its network operating system to the most secure and responsive version of Windows with minimal disruption to ERS staff.

Like most of us, Kathy also wears several hats outside ERS, but one is particularly notable: Kathy is a registered volunteer with the Foster Family program of the Arlington Diocese of Catholic Charities. For over 20 years, she has provided a safe haven for women in crisis pregnancies—about 2 dozen in all—giving them much-needed stability while they work out long-term solutions for independent living with assistance from Catholic Charities.

For the past decade or so, Kathy has brought her community spirit to ERS, serving as a coordinator for the annual Combined Federal Campaign (CFC), the Federal Government's charitable giving program. Each year, Kathy brings a new level of energy to the job, helping to ensure that ERS's contributions always exceed the governmentwide average.

For her dedication to community service both within and outside the workplace, the Combined Federal Campaign of the National Capital Area (CFCNCA) recently named Kathy the 2004 CFCNCA Heroine of the Year. Kathy was nominated for this award along with many other highly deserving CFC volunteers from all Federal agencies in the Washington, DC, metropolitan area and was selected as the winner out of 25 finalists. Reflecting her generous spirit, Kathy says "I'm just one of many ERS employees dedicated to community service."

Leslie A. Whitener

Seven decades of experience with commodity-based farm programs tells us that they have effects far beyond the farm, with implications for rural businesses, residents, and communities. The link between agricultural policy and rural economies is Leslie Whitener's latest pursuit in a career devoted to the study of rural economic and policy issues. In an upcoming conference sponsored jointly by ERS and the National Center for Food and Agricultural Policy, Leslie is assembling researchers and policy analysts to stimulate new thinking about the changing role of farm and rural policy. Leslie notes that "a clear understanding of policy objectives and intended beneficiaries must be the starting point for discussions of future policy well in advance of the next farm bill."

During her 20-plus-year stint at ERS, Leslie has examined many aspects of rural American life, ranging from welfare reform to rural housing poverty to farm economic issues. In *A Safety Net for Farm Households* (www.ers.usda.gov/publications/aer788/), she and her co-authors considered alternative scenarios for government assistance to agriculture, based on the concept of ensuring some minimum standard of living. They found that only one safety net scenario would generate lower costs than current programs, but the distribution of benefits would change dramatically. Lower income farmers would benefit relatively more from the safety net scenarios, while farmers producing selected commodities would benefit more from the current programs.

Leslie explored the effects of existing safety net programs on rural residents as editor of a 2002 book, *Rural Dimensions of Welfare Reform*, the first comprehensive assessment of the effects of welfare reform in rural areas. While the 1996 welfare reform legislation succeeded in reducing welfare dependency and increasing employment and earnings at the national level, results in rural areas were mixed. One of the policy lessons learned from the research is that the poorest, most rural areas are often the hardest to serve.

Leslie joined ERS right out of college and continued to pursue her education, completing a Ph.D. in sociology at The American University in Washington, DC. During her career, she received several awards, including two Secretary's Honor Awards for Excellence in 2002. For the past 8 years, Leslie has served as Chief of the Rural Economy Branch in the Food and Rural Economics Division. With a multidisciplinary approach, this 24-person staff of economists, sociologists, geographers, and statisticians conducts a broad array of research and policy analyses on rural America. Under Leslie's initiative, the Branch created the *At A Glance* series of short, brochure-like publications, each covering a specific topic about rural America. These reports analyze the ongoing changes in rural areas to help policymakers assess strategies to enhance economic opportunity and quality of life for rural Americans (www.ers.usda.gov/emphases/rural/ataglance.htm).

Photos: Tom McDonald, USDA/ERS